



Manual for Planning and Installation

RIB-ROOF
metal roofing systems

RIB-ROOF INSTALLATION FILMS

We at RIB-ROOF know that speed is only a question of technique. If it must be done quickly, you can watch our basic installation steps for our metal roofing systems RIB-ROOF Speed 500 and RIB-ROOF 465 as a film. Both on the PC and on your smartphone when travelling or on the construction site.



FILM OF INSTALLATION PRINCIPLE RIB-ROOF SPEED 500

Discover within two minutes how to install RIB-ROOF Speed 500 with straight profiled sheets and standard clips. Direct link for smartphones, which are QR-capable, or on the Internet <http://install-speed500.zambelli.de>



FILM OF INSTALLATION PRINCIPLE RIB-ROOF SPEED 500 CURVED PROFILED SHEETS

Discover within two minutes how to install RIB-ROOF Speed 500 with curved profiled sheets and turned clips. Direct link for smartphones, which are QR-capable, or on the Internet <http://install-speed500-curved.zambelli.de>



FILM OF INSTALLATION PRINCIPLE RIB-ROOF SPEED 500 FLAT CLIP BORDER ON RIGID INSULATION BOARDS

Discover within two minutes how to install RIB-ROOF Speed 500 with flat clip border and directional profiles. Direct link for smartphones, which are QR-capable, or on the Internet <http://install-speed500-clipborder.zambelli.de>



FILM OF INSTALLATION PRINCIPLE RIB-ROOF 465

Discover within two minutes how to install RIB-ROOF 465 with straight profiled sheets and standard clips. Direct link for smartphones, which are QR-capable, or on the Internet <http://install-465.zambelli.de>



FILM OF INSTALLATION PRINCIPLE RIB-ROOF SLIDING STANDING SEAM ROOFING WITH DIRECTIONAL CLIPS

Discover how the directional clip sets the direction for a linear expansion. Direct link for smartphones, which are QR-capable, or on the Internet <http://sliding-standing-seam-roofing.zambelli.de>



FILM "LIVE INSTALLATION": 920 SQM ROOF AREA WITHIN 2 HOURS

This documentation film shows how quickly roofing with RIB-ROOF metal roofing systems works. Direct link for smartphones, which are QR-capable, or on the Internet <http://movie-speed500.zambelli.de>



FILM OF MOBILE ROLLFORMING

Discover how smoothly the production of profiled sheets with lengths over 33 m works on site by means of our mobile rollforming machines. Direct link for smartphones, which are QR-capable, or on the Internet <http://mobile-rollforming.zambelli.de>

Zambelli channel on Youtube:

You can find installation instructions, CAD visualization and construction site documentation at <http://www.youtube.com/ZambelliGermany>

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GENERAL

QUALITY ASSURANCE AND AUTHORISATIONS

THEORY AND PRACTICE

This practical manual should help you to plan and process our products professionally to guarantee the functionality and quality of the projects which are equipped with them.

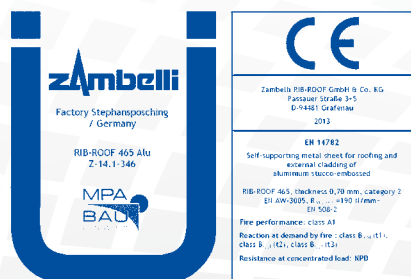
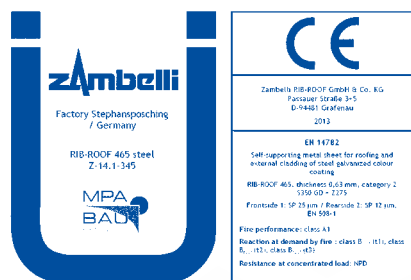
It corresponds to the present state of technique and was drawn up to the best of one's knowledge. However, the manual doesn't release the installer from a critical check in each case. Suable claims of any form cannot be derived from it. The regulations and guidelines of the System Authorisation by Construction Authorities have to be observed.

We provide for an intensive training of specialised companies where we can pass on our experience and gathered processing expertise.

Special trainings impart theoretical and practical basics:

- Installation instruction given by our trained supervisors at site
- 2-day-theory-workshop with main focus on installation technique
- 1-day-theory-workshop with main emphasis on structural physics and roof constructions

1.1 QUALITY ASSURANCE AND AUTHORITIES



For more than 30 years now Zambelli has been manufacturing RIB-ROOF metal roofing systems. The production of the profiled sheets is implemented in one of the most modern factories in Germany. The sliding standing seam profiled sheets RIB-ROOF Speed 500 and RIB-ROOF 465 in aluminium and steel are approved by the German Institute for Construction Authorities in Berlin.

General System Authorisation approved by Construction Authorities:

RIB-ROOF Speed 500:

Nr. Z-14.1-473 (steel)

Nr. Z-14.1-474 (aluminium)

RIB-ROOF 465:

Nr. Z-14.1-345 (steel)

Nr. Z-14.1-346 (aluminium)

CE identification code according to DIN EN 14782.

The external monitoring with UE-tags is implemented by the material-testing institute of the University of Hanover. Zambelli carries out additional control-checks, as well as internal and external monitoring in order to guarantee a constant level of quality in material and production.

RIB-ROOF metal roofing systems are characterized by an optimal fitting accuracy and the highest processing quality. The advantages of a high-quality product, its superior technical construction and comprehensive know-how during processing, form the basis for a perfect roof.



Our ordinary membership of the IFBS ("Industrieverband für Bausysteme im Metalleichtbau" – Max-Planck-Straße 4, D-40237 Düsseldorf, www.ifbs.de) helps us to achieve our stated quality aims in our quality management system. The IFBS is an important industrial association that represents companies operating in the field of construction systems in light metal.

Member of:

IFBS Industrieverband
für Bausysteme
im Metalleichtbau

1.2 SERVICE

This manual guide provides you with standardised solutions. If more technical advice is needed please contact us by phone +49 (9931) 89590-0 or, of course, in a personal dialogue.

Please send your fax-request to **+49 (99 31) 89 59 0 - 49**
or your e-mail to rib-roof@zambelli.de.

Project planning

Only who plans practicable will achieve a perfect result. The RIB-ROOF team already supports you in the preparatory phase with the following services:

- Preparation of detailed solutions
- Support with CAD detailed planning
- Preparation of individual specifications and schedules of prices
- Development of special solutions, specifications and construction of roof mock-ups
- Statics and structural advice
- Preparation of cost estimates and calculation support
- Proposals for solution for an optimal construction-progress planning

Construction coordination, property supervision and installation support

Complex projects and international building projects, as well as their execution, always represent a great challenge. Our roof experts support contractors, planners and laying personnel, as required, with the following services:

Project planning and construction coordination

- Drawing up of laying plans and detailed plans, as well as the development of special solutions
- Project detailed planning
- Requirement and time planning, as well as drawing up of bills of material
- Project management (personnel, cost and schedule control)

Installation support

- Carrying out of installation trainings
- Supervision and accompanying construction support and quality assurance at site
- Providing of installation specialists
- Logistics support (e.g. setting up just-in-time delivery plans)
- Providing special spreader beams for lifting of profiled sheets up to 72 m sheet length
- Carrying out of aluminium welding works on roof penetrations
- Providing of trained specialist personnel for asbestos disposal TRG 42
- Installation of fall arrest systems

Staff installation support

With tight deadlines, you will need all hands on deck! In particular with large-scale projects in Germany and in foreign countries, roof-laying companies come back to RIB-ROOF personnel for installation support. Here you can benefit in two ways:

- Knowledge transfer through experienced and skilled construction workers
- On-time project realisation without any calculation surprises

Calculation hotline
+49 (99 31) 8 95 90 - 54

Some questions cannot wait. Especially if it has to do with the preparation of an installation offer. Therefore, we are at your disposal under this hotline if you have any questions about the installation-time calculation. Do not hesitate to contact us by phone or talk to your area manager.

GENERAL

MATERIALS, SURFACES AND COLOURS



1.3 MATERIALS, SURFACES AND COLOURS

WIDE RANGE OF MATERIALS, SURFACES AND COLOURS

RIB-ROOF profiled sheets are available in a wide range of materials, surfaces and colours. For more information please have a look at our brochure on this topic.

Use the advantage of RIB-ROOF with a wide range of material, colour and surface selection. Only materials, which had been examined before, are used. Zambelli is subject to external monitoring carried out by the material-testing-institute of Hanover (MPA).



Material weight of profiled sheets

Material	thickness (mm)	RIB-ROOF Speed 500	RIB-ROOF 465
Material weight approx. kg/m ²			
Steel	0.63	6.76	7.24
	0.75	7.93	8.49

Material	thickness (mm)	RIB-ROOF Speed 500	RIB-ROOF 465
Material weight approx. kg/m ²			
Aluminium	0.70	2.53	2.71
	0.80	2.89	3.09
	0.90	3.26	3.48
	1.00	3.62	3.87

The temperature-related material expansion of materials is guaranteed horizontally through the profile form and vertically through the movement of the profiled sheets on and in the sliding clips.

The object-related production of profiled sheets – from ridge to eaves without any transversal joint – guarantees planners and contractors the greatest possible safety for their roof.

Temperature-related material expansion

Expansion coefficient α between

$$-20^{\circ}\text{C and } +80^{\circ}\text{C in } \frac{\text{mm}}{10\text{ m} \times 10\text{ K}}$$

Example: Temperature-related material expansion with aluminium and a temperature difference of 60 K and a length of 30 m.

$$\Delta L = \alpha \times \Delta T \times L = 2.4 \times \frac{\text{mm}}{10\text{ m} \times 10\text{ K}} \times 60\text{ K} \times 30\text{ m} = 43\text{ mm}$$

Material	α
Aluminium	2.4
Concrete	1.2
Lead	2.9
Bronze	1.8
Stainless-steel *	1.6
Copper	1.7
Brass	1.9
PVC	8.0
Titanium-zinc	2.2
Steel	1.2
Brick work	0.5
Zinc	2.9
Tin	2.3
* (Material no. 1.4301)	

When putting RIB-ROOF profiled sheets together with other materials or elements, the following list has to be observed:

Possible combination of metals

	Aluminium	Steel sheet galvanised	Zinc	Copper	Stainless steel	Lead
Aluminium	+	+	+	-	+	+
Steel sheet galvanised	+	+	+	-	+	+
Zinc	+	+	+	-	+	+
Copper	-	-	-	+	+	+
Stainless steel	+	+	+	+	+	+
Lead	+	+	+	+	+	+
+ suitable for combination - unsuitable for combination						

The elements made out of different metals, according to the above-stated list ("Possible combination of metals"), mustn't be in direct contact if they show different potentials and the metal with the

higher potential lies at the top of the direction of flow of the rainfall water which acts as electrolyte.

■ The impact on **aluminium and aluminium mill-finish** through alkalis out of concrete or mortar and through aggressive wood protecting liquids or preservers has to be avoided when installing separation layers.

■ The usage of **titanium-zinc** requires special attention.

Titanium-zinc forms a natural protective layer, which is known as Patina, on its surface under the influence of the atmosphere. But this is on the rear side only possible through sufficient air motion, e.g. with a structured mate on a fully bonded load bearing surface. Please observe the reduced dimensions between the fixing elements (refer to reduced chapter 2.9 and 2.10). Contact us!

GENERAL

MATERIALS, SURFACES AND COLOURS

Selection criteria for corrosion-protection-systems, Corrosion categories according to DIN EN ISO 12944 for steel sheets

The assignment of the corrosion-protection-classes according to DIN EN 18807 to corrosion categories according to DIN EN 12944-2 is stated dependent on the duration of protection and the atmospheric demands stated in table 1, DIN 55634:2010-04.

Corrosion categories/ corrosion impact according to DIN EN ISO 12944-2	Duration of protection	Examples for environment (for your information)		Corrosion persistence category ^b	Corrosion-protection class ^a	
		outside	inside		accessible ^c	inaccessible
C1 insignificant	low	-	heated buildings with neutral atmospheres, e.g. offices, stores, schools, hotels	RC1	I	I
	medium				I	I
	high				I	I
C2 low	low	atmosphere with low soiling. Most of the time rural areas	unheated buildings where condensation can occur, e.g. stocks, sport halls	RC2	I	II
	medium				I	II
	high				I	III
C3 moderate	low	city and industry atmos- phere, moderate soiling through sulphur dioxide. coastal areas with low salt pollution	production halls with high humidity and a bit air pol- lution, e.g. machines for food production, laundries, breweries, dairies	RC3	II	III
	medium				II	III
	high				II	III
C4 strong	low	industrial areas and coas- tal regions with moderate salt pollution	chemical industries, swim- ming pools, boat sheds built above sea water	RC4	III	III
	medium				III	III
	high				III	_d
C5-I very strong (industry)	low	industrial areas with high humidity and aggressive atmosphere	buildings or areas with almost permanent condensation and high pollution	RC5	III	_d
	medium				III	_d
	high				_d	_d
C5-M very strong (sea)	low	coastal and off-shore are- as with high salt pollution	buildings or areas with almost permanent condensation and high pollution		III	_d
	medium				III	_d
	high				_d	_d

^a The stating of the corrosion-protection-class only has the function of classifying previous approved demands by Building Authorities for the new European classification system composed of the corrosion category and the duration of protection.

^b According to DIN EN 10169 only for fire coating

^c The practicability of control and repair measures for "accessible" classified areas already has to be planned when producing. The accessibility can be guaranteed by e.g. straight ladders, stand framings, fixed, freely-suspended or led working levels.

^d The corrosion-protection classes aren't applicable with very high corrosion loading and high time of protection and with special loading. The required measures with this loadings and conditions have to be determined in each case.

According to DIN 55631: 2010-04, table A.1 and A.2 the following "expected duration of protection" is each assigned to RIB-ROOF system construction components:

	C2			C3			C4			C5-I			C5-M		
	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Alu-zinc steel sheet with alu-zinc alloy, coating thickness 25um, (System-no. A1.11)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Steel sheet galvanised on both sides and coil coated, front side 25um polyester lacquer (System-no. A2.3)	✓	✓	✓	✓	✓	✓*	✓								
Steel sheet galvanised on both sides and coil coated, front side 25um PVDF lacquer, (System-no. A2.14)	✓	✓	✓	✓	✓	✓	✓	✓		✓					

* For coastal areas with salt pollution not to recommend

1.4 STRUCTURAL PHYSICS / LOAD BEARING STRUCTURE

1.4.1 STRUCTURAL PHYSICS

We don't want to deal here with the installation of the load bearing structure and substructure for RIB-ROOF profiled sheets in detail, we only want to say:

The guidelines for the execution of metal roofs, claddings and plumber published by the Central Association for Sanitary, Heating and Air Conditioning as well as the relevant DIN- and EN-standards differentiate the so-called single-deck roof constructions with thermal insulation (known as warm roof) or without thermal insulation, respectively, from the double-deck roof construction with air cavity ventilation/ventilation (known as cold roof).

Metal roofs with air ventilation have a ventilated cavity with ventilated openings – as a rule, on eaves and ridge – in order to condensate the cold metal rear side and to be able to expel the existing amount of humidity in the cavity.

The sufficient dimension is construction-related and has to be considered when planning and executing. A mechanical ventilation is necessary with a roof construction which doesn't have a natural air lift. You might be aware of the fact that a large number of factors can negatively affect the functionality of the ventilation of a double-deck roof construction. For buildings which are in the planning phase, a single-deck construction with a vapour barrier membrane (Sd-value ≥ 100 m) without any ventilation is recommended.

Roof constructions with thermal-insulation and non-ventilation require a vapour barrier membrane for bordering and above-ground building components as well as all roof penetrations so that everything is wind-proof and vapour-proof.

When determining the U-value for the entire roof the thermal-

protection-evidence, according to EnEV, for the influence of fixing constructions has to be considered. The results of calculations made by the Research Institute for Thermal Insulation ("Forschungsinstitut für Wärmeschutz e.V.") clearly show the negative effect of metal distance structures when made without thermal separation. They act as thermal bridges and, therefore, reduce the insulation of the building. It is thus recommended that distance constructions/roof structures with good U-values according to chapter 2.3 "Roof structure" should be used.

The guidelines of the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) recommend the installation of a vapour-diffusion-opened protective sheet on thermal insulation under certain conditions in order to protect them against humidity and secondary melt water which may occur on the rear side of profiled sheets under inclement weather conditions. We refer to a precise processing of bordering and above-ground building components.

You can dispose of the vapour-diffusion-open protective sheet if the mineral thermal insulation which lays under it is compressed about approx. 20 mm.

More information you will find in chapter 2.5 "Pro/Contra diffusion-open protective sheet or rigid insulation boards".

DIN 4102
DIN 4108
DIN 4109

An important precondition for functionality, quality and efficiency of a building is the observance of the basic rules of building physics. You can find them e.g. in the German Industry Standards:

- 4102** – Fire behaviour of building materials and building components,
- 4108** – Thermal protection and energy economy in buildings and
- 4109** – Sound insulation in buildings

They have to be observed in the individual cases.

GENERAL

STRUCTURAL PHYSICS / LOAD BEARING STRUCTURES

1.4.2 LOAD BEARING STRUCTURES

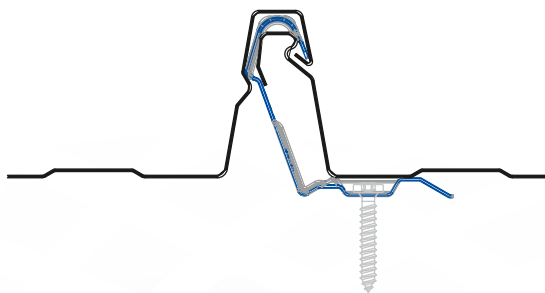
One of the most common load bearing structures are trapezoidal steel profiles. This design forms the basis for the following descriptions and photographs.

The installation on these and alternative substructures and possible fixing elements are summarised in the table below.

SUBSTRUCTURES

Substructure	Fixing material
Wooden lathing/ purlins	wood screws with full thread 6 x 40 mm
Timber boarding t = minimum 24.0 mm	wood screws with full thread 6x 40 mm or 5 x 30 mm
Steel purlins t ≤ 4.0 mm	self-drilling screws 5.5 x 25 mm or blind rivets out of aluminium with head Ø 15.0 mm or 4.8 x 17 mm; pre-drilling necessary
Steel purlins t ≥ 4.0 mm	blind aluminium rivets with head Ø 15.0 mm or 4.8 x 17 mm; pre-drilling necessary or standard clips RIB-ROOF Speed 500 without holes with Hilti-setting bolts
Trapezoidal profiles	self-drilling screws 5.5 x 25 mm
Wooden lathing on trapezoidal profiles	self-drilling screws Torx T25 SFS SD2 / KL-(S)-S11-6°L Ejot JT3 / JT2-ST-2-6,0°L
Aerated concrete	SFS-IGR, Ejot SDP (please observe extracts)
Reinforced concrete	dowel system Ejot SDF 8.0 mm

Table of possible substructures and the necessary fixing element; fixing element for other substructures on request.



Use only screws with a flat screw head at the bottom
(no counter-sunk screws).
Screw head height max. 5.5 mm in general.

Please pay attention to the guidelines stated in our System Authorisations approved by Construction Authorities, chapter 4.2 Fixing element (= clip): "The fastening of fixing element to the substructure should be carried out with the stated and suitable fixing elements

according to our System Authorisations approved by Construction Authorities (e.g. no. Z-14.1-4) and standards (e.g. DIN 1052). When using wooden lathing a minimum thickness of 40 mm and minimum width of 60 mm has to be considered.



Special spreader beam for extra long profiled sheets.

1.5 TRANSPORT OF MATERIAL / STORAGE

1.5.1 TRANSPORT / UNLOADING

Profiled sheets are normally transported by truck without crane. The access to the desired destination must be guaranteed. The material has to be checked for completeness and damage immediately after having been delivered. The consignments are marked with: **name of factory – description of profiled sheets – number of authorisation – UE-symbol – CE tag.**

If there are any complaints, they have to be written down on the delivery note and our factory has to be informed immediately.

The profiled sheets which are packed as bundles (bundle weight max. 1.5 t) have to be unloaded with suitable lifting machines (crane or fork-lift truck). Please also pay attention to the punctual provision of a crane or fork-lift truck after having been informed about the delivery date.

The delivery is generally effected without any provision of a crane or a fork-lift.



A spreader beam for sheets lengths up to 30 m, incl. fixed crane hook without any belts, net weight 980 kg, plus usefull load max. 1500 kg, will be provided, upon request, in a half-finished and pre-assembled condition. Further special spreader beams are available upon request.

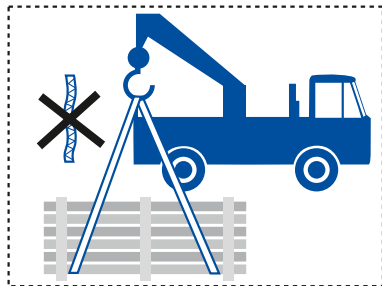
GENERAL

TRANSPORT OF MATERIAL / STORAGE

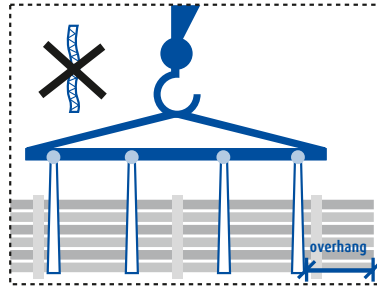
When using cranes, the unloading should be realized with belts. The edges of the profiled sheets have to be protected against mechanical damage.

You have to use **spreader beams** for RIB-ROOF 465 with lengths of more than 12 m made out of aluminium, copper and zinc, and with lengths of more than 18 m made out of steel sheet. Overhangs of more than 4.50 m with aluminium and steel or of more than 2.0 m

with copper and titanium-zinc respectively have to be avoided. RIB-ROOF Speed 500 profiled sheets with lengths of more than approx. 10 m should be unloaded by using a **spreader beam**. The depositing and storing of profiled sheets on a roof requires the consideration of the load bearing capacity of the substructure. The profiled sheets have to be secured against taking off and sliding.



Unloading with crane end carriage: wide belts (at least 10 cm wide) protect the profiled sheets against mechanical load and damage.

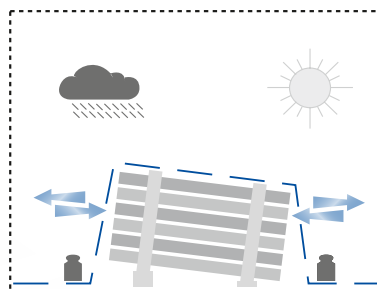
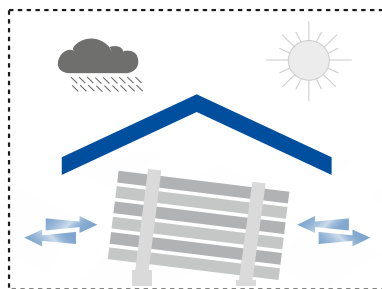


Overhang max. 4.50 m or 2.00 m with copper and titanium-zinc respectively.

1.5.2 STORAGE

If the profiled sheets/flashings aren't installed immediately, you have to provide for an adequate protection against the influence of the weather. They must be stored sloping in the direction of the profiled sheets in order to be able to divert rainwater and secondary melt water.

If they are covered with tarpaulins, the latter must be wind-proof and adequately ventilated. Liability is excluded in case of improper storage.



Flashings: in order to avoid secondary melt water/condensation water the packing foil has to be removed.

GENERAL

TRANSPORT OF MATERIAL / STORAGE

GENERAL



1.5.3 PROFILING AT SITE / MOBILE ROLLFORMING

The production of profiled sheets with lengths of more than 33 m is possible on site with our mobile rollforming machines.



Watch our film on this subject:
<http://mobile-rollforming.zambelli.de>



GENERAL

MATERIAL PROCESSING

1.6 MATERIAL PROCESSING

1.6.1 DIVIDING AND CUTTING

The RIB-ROOF elements are divided and cut by means of suitable shears, plate shears, compass and circular saws with hard-metal blades. Cutting discs have to be avoided, as the arising flying sparks may damage the surface which, in turn, can lead to corrosion damage.

- Corrosion-protected materials (steel sheet with alu-zinc alloy or galvanised and colour-coated respectively) require further treatments of the cutting edges.
- Drilling chips and chip cuttings have to be removed immediately of the surface since they could also damage the material.
- You have to pay attention to the different materials when bending coil material out of RIB-ROOF raw material. The table on the right-hand-side shows the smallest possible bending radii of the metals.
- Markings shouldn't be made with sharp objects; therefore, we recommend the use of soft pencils.

Bending radii for flashings out of RIB-ROOF raw material

You have to pay attention to the different material qualities when bending coil material (bending on a bending bank) out of RIB-ROOF raw material. The table shows the smallest possible bending radii in which the material aluminium shows a minimum bending radii of 3.00 x material thickness t in mm with a working temperature of 20°C.

Material	Minimum bending radii
Aluminium, t = 0.70 mm	2.10 mm
Aluminium, t = 0.80 mm	2.40 mm
Aluminium, t = 0.90 mm	2.70 mm
Aluminium, t = 1.00 mm	3.00 mm
Steel sheet	2.50 mm
Titanium-zinc	1.75 mm
Copper	1.75 mm

Table of smallest possible bending radii of different metals

Maintenance advice

The metal surfaces should be cleaned with cleaning agents which are bio-degradable and environmentally-friendly, but not aggressive. Rinsing with cold water is generally necessary. The removing of damage to paintworks has to be done with the greatest possible care. We can deliver our standard lacquers according to Zambelli's colour chart upon request.

Please note that they could slightly differ in shade. Damage on zinc-alloys can only be treated after having consulted to the producer. Minor chromatic aberrations and natural surface deviations can arise when using different batches, but do not represent any defects.





Transversal joint at roof with a segment of a circle with tapered profiled sheets



Welded-in dome light with dilatation band; lightning protection bracket

1.6.2 FASTENING TECHNOLOGY/WELDING/SOLDERING

You have to pay attention to the different materials when connecting metals (please refer to chapter 1.3).

The lacquer of colour-coated aluminium has to be removed before welding and soldering. You have to lacquer the blank surface with

the appropriate lacquer after having finished working. The fastening technologies are described in detail in the instructions of the material producers of aluminium, steel sheet, titanium-zinc and copper. Upon request, we will suggest you specialised RIB-ROOF welders.

1.6.3 BONDING

A possible alternative is the bonding of metals according to the explanatory leaflet "Bonding in plumbing" published by the Central Association for Sanitary, Heating and Air Condition (ZVSHK) in 53757

St. Augustin, Germany. Single-component polyurethane adhesives are normally used in plumbing.

RIB-ROOF METAL ROOFING SYSTEMS

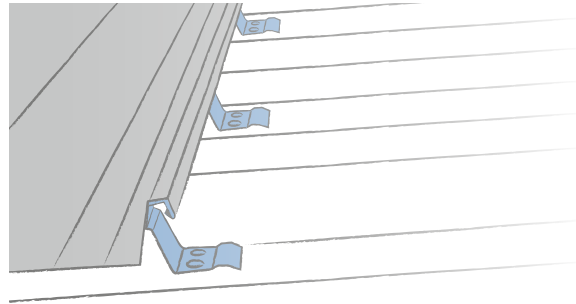
THE RIB-ROOF PRINCIPLE

2.1 THE RIB-ROOF PRINCIPLE

RIB-ROOF Principle 1: **"Simply doing everything right."**

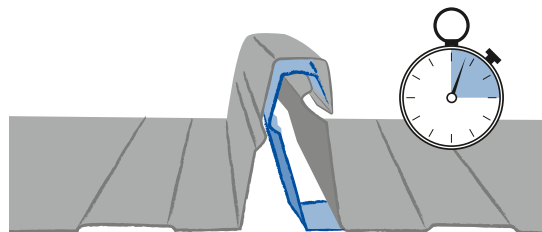
The RIB-ROOF clip installation system reduces the number of work steps to a minimum. This is because the profiled sheet specifies the optimum position of the fixing clip. This means that once the first row of clips is set, no further measuring and pre-assembling of every clip is necessary.

As a result of direct clip installation, the position of the fixing clips is specified without the need to make measurements. As such, the clips are perfectly aligned to the roof profiles. No constraining forces arise as a result of misaligned or twisted fixing clips.



RIB-ROOF Principle 2: **"Quick and simple installation throughout."**

With RIB-ROOF, there is no need for time-intensive measuring of the fixing clip positions. Apart from this, there is another key difference that sets RIB-ROOF apart from other industrially pre-fabricated metal roofing systems: RIB-ROOF does not have to be mechanically zipped on the construction site. They do not require any special machinery and can be installed regardless of the prevailing temperature. A unique feature of the profiled geometry is the fact that a non-positive connection is made using the profiled sheet.

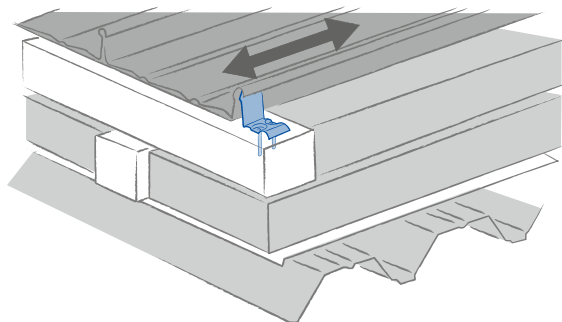


By means of a non-positive lock, the click-into-place mechanism saves time and ensures that the connection on the profiled sheet is permanent.

RIB-ROOF Principle 3: **"Everything is perfectly proportional."**

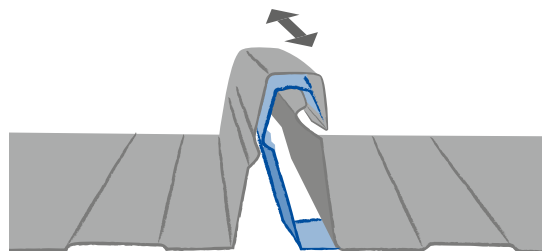
Ultimately, it comes down to the right measurements ... at least this is the case with clip geometry. The fixing clip is adjusted to the base height of the profiled sheet. This way, any leverage on the roof membrane is prevented.

As a result of the low height of the RIB-ROOF sliding clips, tilting movements are hindered.



RIB-ROOF Principle 4: **"Everything is perfectly pre-fabricated."**

With RIB-ROOF, the profiled sheets are connected by their geometry: A method that enables a certain amount of slippage. There is no rigid zipping. If zipping is incorrectly executed in a way that is too narrow, tensions can arise in the fixed link of the profiled sheet. In the case of RIB-ROOF's non-positive, profiled sheet connection, when the installation work is performed, the system works to ensure that these sources of error are ruled out.

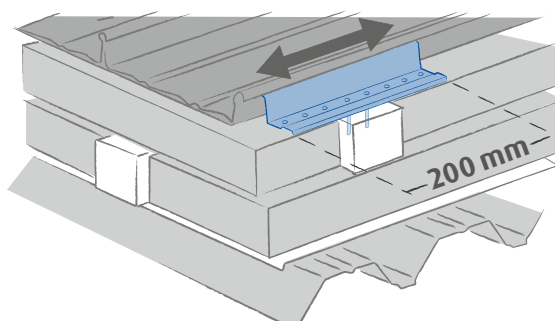


The RIB-ROOF fixing system circumvents the development of tensions in the profiled sheet's fixed link and installation errors that arise through the pressure of time and improper processing (e.g. when zipping).

RIB-ROOF Principle 5: **"Everything is guided into place."**

Depending on the application, the newly developed RIB-ROOF directional clip has a length that ranges between 20 and 150 cm. As such, it acts as a guiding rail for the profiled sheets. Especially in the case of long profiled sheets, this provides the roof membrane with added security, as the direction of the dilatation movements is specified.

A perfect team: The profiled sheet sets the position of the directional clip and the directional clip specifies the dilatation movement.



RIB-ROOF METAL ROOFING SYSTEMS

BENEFIT FROM A SYSTEM

2.2 BENEFIT FROM A SYSTEM

Simple installation technology

Setting, swivelling, clicking. RIB-ROOF metal roofing systems provide you with a fast, simplified and, especially, uncomplicated way to carry out the installation. As such, the principles behind the RIB-ROOF form the basis for a roof where long-term functionality is ensured.

The innovative fixing systems

RIB-ROOF is a sliding standing seam roofing. The RIB-ROOF Principles are based on improvements to the way the roof cladding is fixed. This is because the fixing systems are developed in such a way that no tensions arise through wind load or dilatation that is a consequence of temperature-related conditions. Good sliding qualities ensure long-term functional security.

The crucial saving in terms of time

With very short construction times, the optimisation of costs and deadlines plays an important role. RIB-ROOF metal roofing systems allow for intuitive laying. This way, the installation is carried out rapidly in one pass. This brings the added bonus of an unbeatable saving in terms of time. As such, in the business of constructing commercial buildings, the laying of a RIB-ROOF roof within a few hours is no longer the exception, but the rule.

An objective view

Economic efficiency is always relative to cost and useful life. RIB-ROOF metal roofing systems stand for advanced technology which simplifies planning and installation. As a result, this approach provides a functionally durable roof. This means less costs and more benefit from a long service life. A calculation that always works in your favour.

Accessible and self-supporting

Therefore, suitable for all standard fields of application on purlins or on fully-bonded surfaces from single-deck rear-ventilated cold roof to thermally-insulated non-ventilated roof structure.

Permanently rain-proof

As a result of a penetration- and transversal-seam-free installation of the profiled sheets and penetration-free installation of the accessories on the profiled sheet seam.

Sustainability

RIB-ROOF sliding standing seam roofs form sustainable constructions and also stand for a cost-efficient roofing systems with aesthetic demands. High quality, durability, easy maintenance and recycling form the basis for a sustainable roofing system. Metal as a construction material and the system advantages provide for the highest safety against forces of nature and fire. Integral considerations of the sum of investigation and maintenance costs show that this method of building isn't only durable but also extremely economic. For more information about sustainability please refer to the IFBS-brochure "Standing seam roofing. The sustainable method of building."

Wide range of different constructions

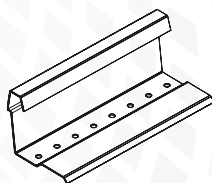
RIB-ROOF profiled sheets are available straight, conical, curved or conical curved. For sheet lengths of more than 33 m, the profiled sheets will be profiled and curved at site, upon request. Apart from the standard widths, we are also prepared to produce project-related measurements.

Perfect system accessories

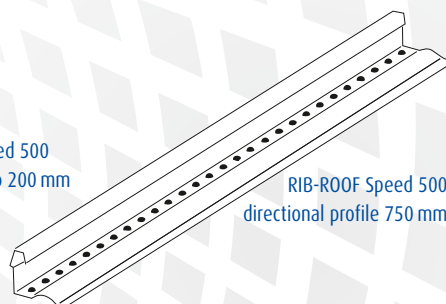
The complete range of pre-assembled accessories allows for a flexible, efficient planning and for a quick, precise installation. Other accessories, such as fall arrest systems, snow guard elements, tread supports and solar brackets, are installed perforation-free on the seams of the profiled sheets.



RIB-ROOF Speed 500
standard clip



RIB-ROOF Speed 500
directional clip 200 mm



RIB-ROOF Speed 500
directional profile 750 mm

RIB-ROOF METAL ROOFING SYSTEMS

ROOF BUILD-UPS

2.3 ROOF BUILD-UPS

For the metal roofing system RIB-ROOF all common substructures for warm and cold roofs are possible as roof build-ups:

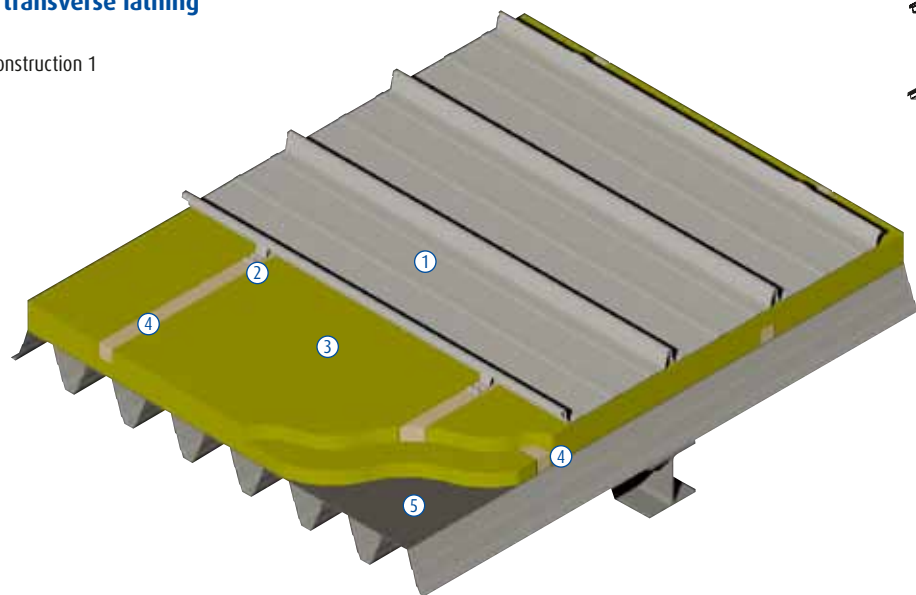
Trapezoidal profiles, wooden purlins, timber boarding ($t =$ minimum 24 mm), steel purlins, aerated concrete or reinforced concrete.

2.3.1 WARM ROOFS

Wooden counter/- transverse lathing

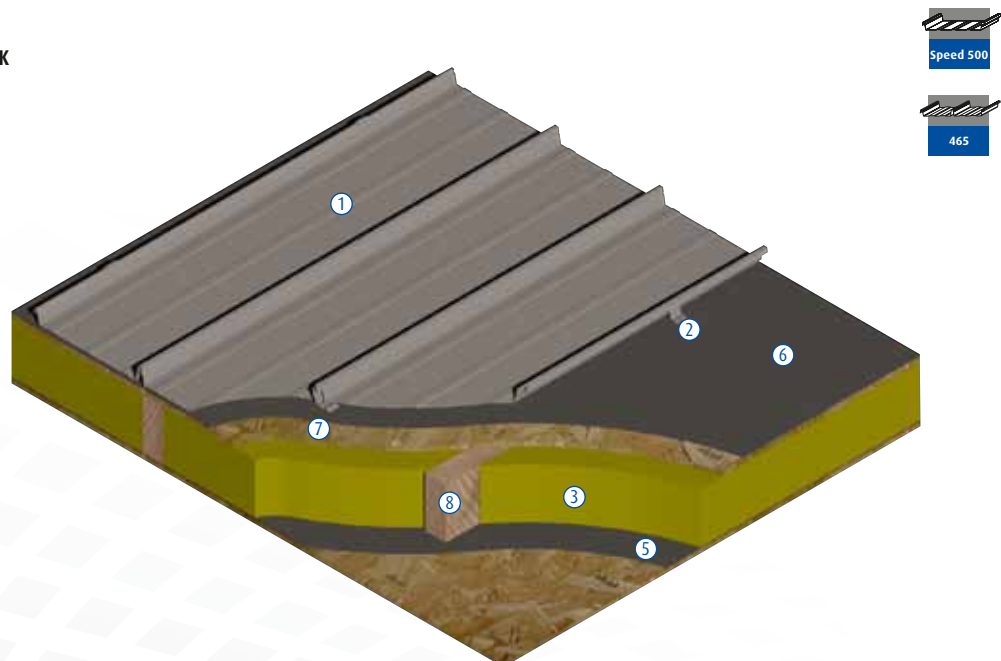
U-value of $0.204 \text{ W/m}^2\text{K}$

refer to FIW-calculation construction 1



Timber boarding

U-value of $0.204 \text{ W/m}^2\text{K}$



- ① RIB-ROOF profiled sheets
- ② Standard clip / directional clip
- ③ Insulation $d = 180 \text{ mm}$, thermal conductivity $0.035 \text{ W/m}^2\text{K}$
- ④ Wooden counter/-transverse lathing (double-layer) at a distance of 1.19 m

- ⑤ Vapour barrier membrane
- ⑥ High-diffusion-open protective sheet
- ⑦ Timber boarding minimum 24 mm
- ⑧ Wooden lathing / purlin (single-layer)

RIB-ROOF METAL ROOFING SYSTEMS

ROOF BUILD-UPS

Installation on fully-inserted supports with clip border

RIB-ROOF Speed 500 can alternatively be installed on fully-inserted supports. Another alternative besides timber boarding is the rigid insulation boards which are also resistant to pressure (application type WD).

As desired, the profiled sheets can be installed on distance profiles

which correspond to the thickness of a thermal insulation, or on clip borders – option perforated or flat – which are fastened to the roof structure.

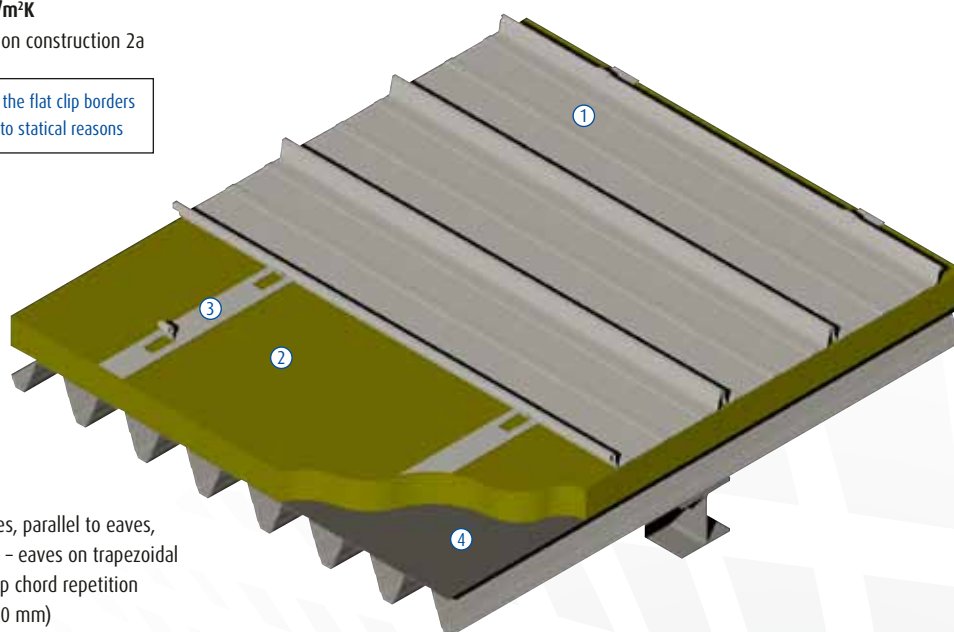
Open butt joints have to be avoided when installing insulation panels. This design is also transferable to RIB-ROOF 465 when using the so-called pressure-distributing profiles.

Roof build-ups with flat clip border

U-value of 0.208 W/m²K

refer to FIW-calculation construction 2a

A regular offsetting of the flat clip borders can be necessary due to statical reasons

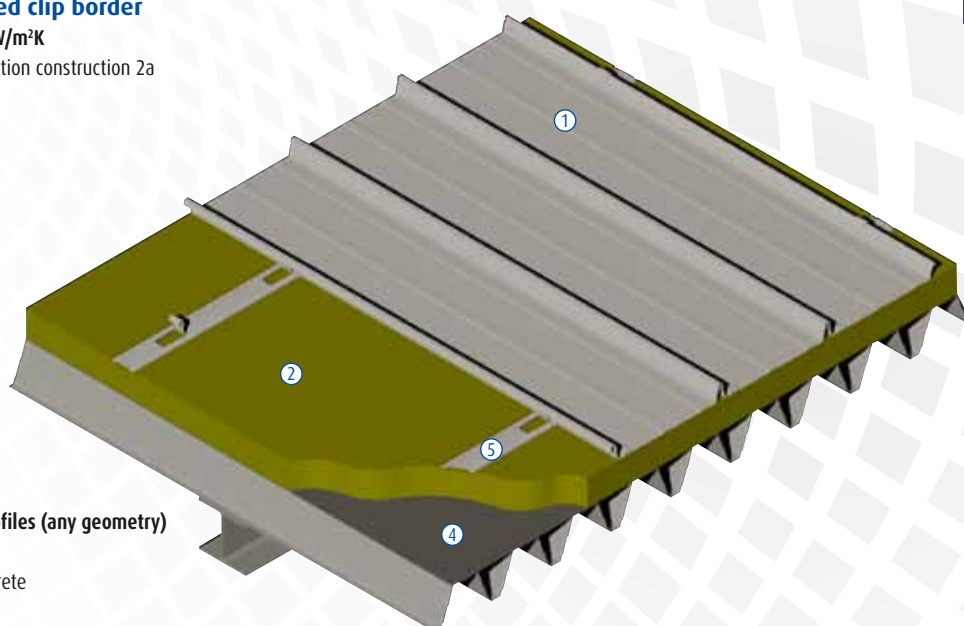


On trapezoidal profiles, parallel to eaves, or alternatively ridge – eaves on trapezoidal profiles (only with top chord repetition every 125, 250 or 500 mm)

Roof build-ups with perforated clip border

U-value of 0.208 W/m²K

refer to FIW-calculation construction 2a



On trapezoidal profiles (any geometry)

Ridge – eaves

or on aerated concrete

- ① RIB-ROOF profiled sheets
- ② Rigid insulation boards $d = 180 \text{ mm}$, thermal conductivity $0.037 \text{ W/m}^2\text{K}$
- ③ Flat clip border at a distance of 1.8 m

- ④ Vapour barrier membrane
- ⑤ Perforated clip border at a distance of 1.8 m

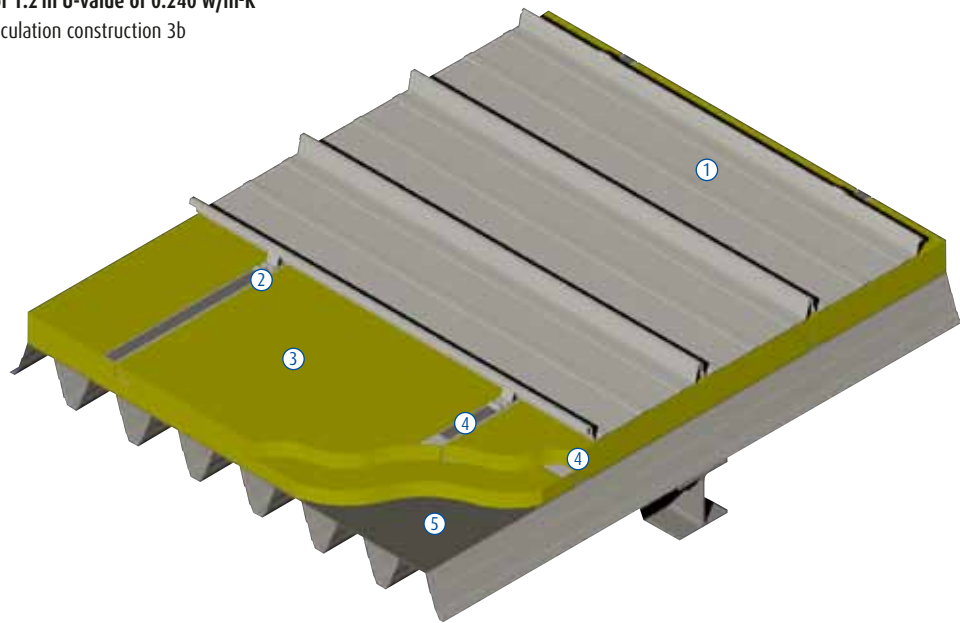
RIB-ROOF METAL ROOFING SYSTEMS

ROOF BUILD-UPS

Double-layer of Z-profiles

with one thermal separation strip on each Z-profile

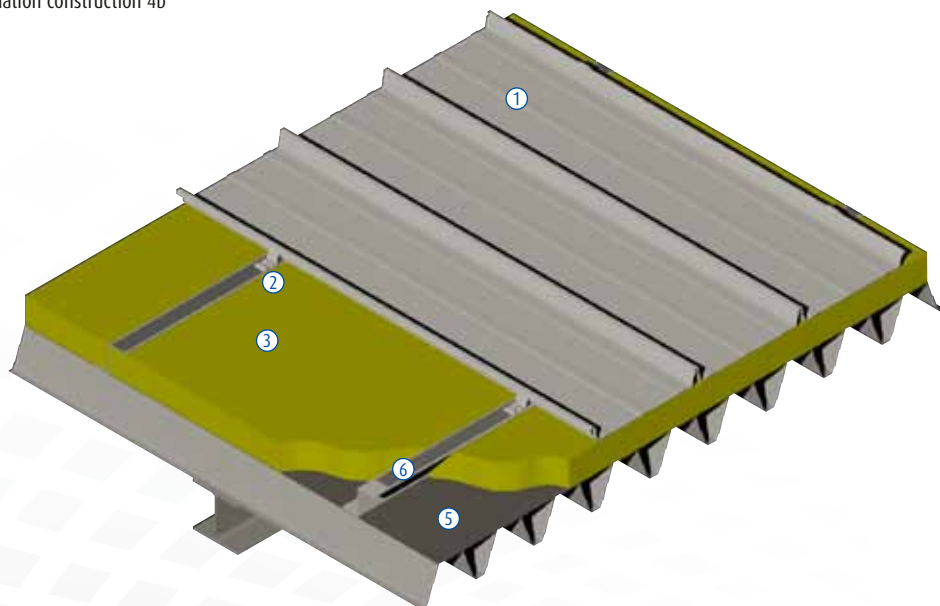
- at a distance of 1.8 m U-value of 0.216 W/m²K
refer to FIW-calculation construction 3a
- at a distance of 1.2 m U-value of 0.240 W/m²K
refer to FIW-calculation construction 3b



Single-layer of Z-profiles

with two thermal separation strips

- at a distance of 1.8 m U-value of 0.271 W/m²K
refer to FIW-calculation construction 4a
- at a distance of 1.2 m U-value of 0.314 W/m²K
refer to FIW-calculation construction 4b



- ① RIB-ROOF profiled sheets
- ② Standard clip / directional clip
- ③ Thermal insulation d = 180 mm,
thermal conductivity 0.035 W/m²K

- ④ Double-layer of Z-profiles with thermal separation strips on each Z-profile
- ⑤ Vapour barrier membrane
- ⑥ Single-layer of Z-profile with two thermal separation strips

RIB-ROOF METAL ROOFING SYSTEMS

ROOF BUILD-UPS

Thermal insulation thickness		180 mm	180 mm	for 0.240 W/m²K***
Description of construction		Heat transition coefficient in undisturbed areas	Heat transition coefficient incl. thermal bridges	necessary thermal insulation thickness for EnEV 2009 table 1, line 4a
	Distance B	W/(m² x K)	W/(m² x K)	mm
RIB-ROOF Speed 500 with single clips on double-layer of wooden substructure; construction 1*	B = 1.19 m	0.189	0.204**	160
RIB-ROOF Speed 500 with clip border on rigid insulation board; construction 2a	B = 1.80 m	0.198	0.208**	160
RIB-ROOF with single clips on double-layer of Z-profiles with two thermal separation strips; construction 3a/b	B = 1.80 m	0.185	0.216**	170
	B = 1.20 m	0.185	0.240**	180
RIB-ROOF with single clips on single-layer of Z-profiles with two thermal separation strips; construction 4a/b	B = 1.80 m	0.185	0.271**	200
	B = 1.20 m	0.185	0.314**	220
Not to recommend: on single-layer of Z-profiles without thermal separation strips; construction 5	(adaption to calculation of B1-17/97) B = 1.20 m	0.189	0.432**	250

* Calculation according to DIN EN ISO 6946

**Source of information: FIW-report B3-24/11 of 8th December 2011: value with thermal insulation 180 mm and WLG 035 each (exception: rigid thermal insulation in construction 2a is WLG 037)

***ENEV 2009, table 1, highest value of heat transition coefficient when installing for the first time, replacement and changing of building components, line 4a, ceilings, roofs and slopes of roofs

Energy saving costs by means of wooden lathing

With distance constructions out of wooden lathing, you can annually save approx. 1300 euros per 1000 m² roof area in comparison to constructions with metal Z-profiles without thermal separation strips according to an investigative report of FIW of 8th December

2011 (calculation with DIN EN ISO 6946, values with thermal insulation 180 mm and WLG 035). The energy saving costs amount to 540 Euros per year for the same area in comparison to metal fixing elements which penetrate thermal insulation.

2.3.2 COLD ROOFS

On wooden substructure
optionally with fleece coating for anti-condensation/sound absorption on rear side of profiled sheets



- ① RIB-ROOF profiled sheet
- ② Standard clip / directional clip
- ③ Wooden purlins / wooden lathing
- ④ Wooden frameworks

RIB-ROOF METAL ROOFING SYSTEMS

MINIMUM ROOF PITCH / DIFFUSION-OPEN PROTECTIVE SHEET

2.4 MINIMUM ROOF PITCH ACCORDING TO GENERAL SYSTEM

AUTHORISATION APPROVED BY BUILDING AUTHORITIES

When using profiled sheets as water-bearing exterior shells of roofs, the following minimum roof pitches have to be adhered to:

Minimum roof pitch of 1.5° (2.6 %) for roofs without transverse joints. The necessary minimum roof pitch raises for roofs with transverse joints and / or penetrations (e.g. dome lights) of 2.9° (5 %).

Roof penetrations:

The increase of the minimum roof pitch which is requested with roof penetrations, e.g. dome lights is not necessary when:

1. Completely welded soakers for sealing are used.
2. The soakers for sealing will be welded with the upper roof shell of the profiled sheets so that an absolute leak-tightness can be reached.

3. Qualifying evidence according to the guideline for welding of supporting building components out of aluminium – edition October 1986 – published by the German Institute for Building Technology with an extended scope of application for building components of less than 1.5 mm thickness was established for welding profiled sheets together or for welding on profiled sheets.

The requirement of a minimum roof pitch for the ridge area is dropped (locally limited) if the roof elements in areas of roof pitches $\leq 2.9^\circ$ (5 %) are arranged in such a way that they go continuously through the ridge (Notice: with curved roofs).

2.5 PRO / CONTRA DIFFUSION-OPEN PROTECTIVE SHEET OR RIGID INSULATION BOARDS

ZVSHK leaflet “Ventilated and non-ventilated metal roofs made of industrial pre-assembled lock seam profiles”

You generally have the possibility with RIB-ROOF metal roofing systems of installing not only a diffusion-open protective sheet but also a compressed thermal insulation. As you can gather from the ZVSHK leaflet “Ventilated and non-ventilated metal roofs out of industrial pre-assembled lock seam profiles”, the ZVSHK (Central

Association for Sanitary, Heating and Air Conditioning) recommends both types of construction. In individual cases, you can weigh up the pro and contras of the two variants and discuss these with project owners and architects. Out of economic reasons, the design with compressed thermal insulation has also proved its worth apart from a diffusion-open protective sheet which has been tried and tested for over two decades.

Pro / contra diffusion-open protective sheet

Pro

- Condensation diversion up to eaves where the complete roof area is laid out with covered joints and installed protective sheets. Also adjustable when water is flow inhibited due to an extreme ice/snow situation on eaves

Contra

- Highest request to laying personnel in order to avoid eventual puddle formation
- Costs

Note: The project owner has to provide for the water flowing off in extreme snow and ice conditions so that it won't stay on the roof.

Pro / contra compressed thermal insulation

Pro

- Less air space which results in minimized formation of condensation
- Improved sound protection: especially when building houses
-> recommendation for increased sound-proofing
(have a look at next page)

Contra

- Water flow can be inhibited with extreme ice/snow situation on eaves which may result in soaking of the thermal insulation (solution: use of a protective sheet with a width of at least 3 m parallel to eaves and additional snow guard rows should be installed according to manual guide chapter 4.11)

Your responsible area manager will be at your disposal if you have more questions on this subject.

RIB-ROOF METAL ROOFING SYSTEMS

RECOMMENDATION: SOUNDPROOFING

Further advantages of our metal roofing system RIB-ROOF in accordance with diffusion-open sheet or compressed thermal insulation:

1. Possibility when using a protective sheet

Especially with the metal roofing system RIB-ROOF you have the **practical choice of installing** a diffusion-open protective sheet on mineral wool because of the geometry of our sliding clips. Since RIB-ROOF clips are fastened **from above through the protective sheet** into the substructure and, therefore, the protective sheet doesn't have to be penetrated below the pre-assembled clips by tearing the foil.

2. Best U-values for warm roofs

With a distance construction made out of wooden counter- and transverse lathing in an installation-friendly distance of 1.19 m in normal range and with intervening mineral wool insulation you can achieve the best values for warm roofs (with vapour barrier membrane Sd-value > 100 m). Please find the achieved and very good U-values, in comparison to metal distance constructions, in an investigate report published by the Research Institute for Thermal Insulation ("Forschungsinstitut für Wärmeschutz e.V. - FIW) in Munich, please refer to table on page 21.

In order to reach the same U-value with metal distance constructions with Z-profiles or with "high" system clips, an appropriate increase in thermal insulation thickness is required (costs)!

3. High diffusion ability for RIB-ROOF sliding standing seam roofing

RIB-ROOF sliding standing seam roofing is more diffusion-open than mechanically zipped systems or conventional angle or double standing seam roofing. The following middle Sd-values are stated in the corresponding investigation "Determining of water permeability" carried out by the FIW-Institute in Munich incorporated association:

- with **RIB-ROOF Speed 500** middle Sd-value of 12.8 m with aluminium 0.70 mm
- with **RIB-ROOF 465** middle Sd-value of 25.7 with aluminium 0.90 mm
- compared to: mechanically zipped system middle Sd-value of 30.6 with aluminium 0.90 mm

Moreover, the RIB-ROOF **seam cavity** and **diffusion-open roof verge** on ridge, eaves and verge enable an **additional air exchange** and, therefore, an additional diffusion effect.

2.6 RECOMMENDATION FOR HIGHER SOUNDPROOFING, E.G. WHEN BUILDING HOUSES

In the leaflet "Soundproofing with metal roof constructions", dated May 2006, published by the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) in 53757 St. Augustin, Germany, you can find under point 9 planning and installation instructions for higher sound proofing when building houses: **"The most important installation principle is to avoid cavity!"** ... The whole profiled sheet width incl. the substructure (timber boarding or insulation) achieves the best (body) soundproofing when contacting the covering material directly".

In the "guidelines for the execution of plumber works on roof and façade (plumber guidelines), dated 11/2009, published by the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) in 53757 St. Augustin, Germany, the following planning instructions as mentioned under point 1.1 planning and working in advance: "In order to reduce beat and temperature-related creaking noise, appropriate safety measures already have to be taken into consideration when planning".

From our own experience, we recommend for the installation of a metal roof with higher soundproofing requirements, e.g. when building houses, **RIB-ROOF Speed 500 out of aluminium, as a warm roof with higher soundproofing without any cavity (also without any rear ventilation).**

Please see the following installation alternatives:

- Either on compressed double-layer thermal insulation between wooden counter- and transverse lathing,
- or on compressed single-layer thermal insulation (delivery thickness 60 mm, installation thickness 40 mm) between timber boarding (at least 24 mm with high diffusion-open protective sheet) and profiled sheets
- or on a slightly compressed acoustics insulation plate (delivery thickness 15 mm with higher ability of pressing it together) on timber boarding (minimum 24 mm with high diffusion-open protective sheet) laid between standard clips of profiled sheets.

General advice for warm roof construction without ventilation:

- According to DIN 4108 / part 3 with vapour barrier membranes (Sd-value > 100m) airtight and vapour-proof, non-ventilated warm roofs don't require arithmetical evidence and are, therefore, safe in regard to building physics.
- The non-ventilated warm roof with vapour barrier membrane (Sd-value 100 m) is, according to the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) "Ventilated and non-ventilated metal roofs out of industrial pre-assembled wedged standing seam roofing", another alternative corresponding to the current state of technique.

If you have more questions on this subject, please do not hesitate to contact us!

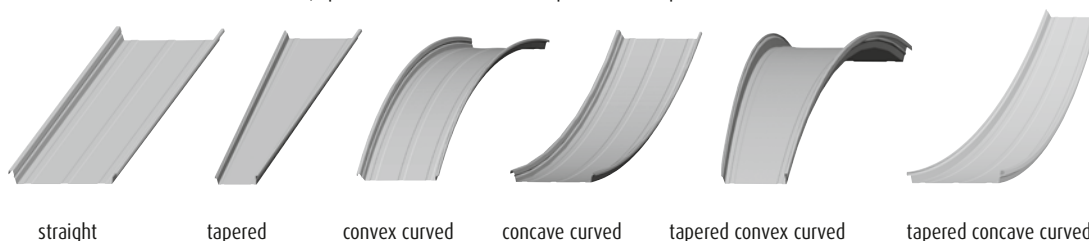
RIB-ROOF METAL ROOFING SYSTEMS

DELIVERY PROGRAM

2.7 DELIVERY PROGRAM

RIB-ROOF Speed 500

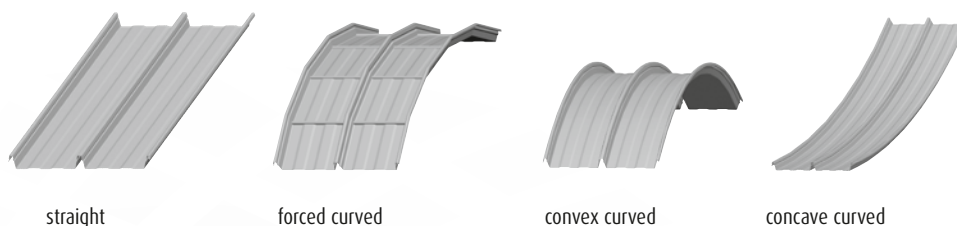
Standard construction width = 500 mm; special construction widths of profiled sheet possible!



Profiled sheet standard construction width 500 mm		Special construction width of profiled sheet 400 mm		Special construction width of profiled sheet 333 mm	
Standard clip	Directional clip	Directional profile	Flat clip border		
Turned clip	Turned directional clip	Turned directional profile	Perforated clip border		

RIB-ROOF 465

Standard construction width = 465 mm

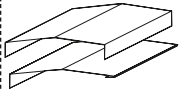
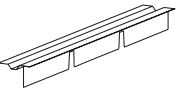
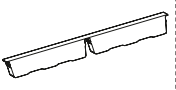
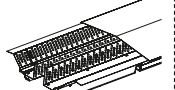
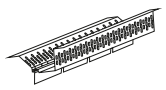


Profiled sheet				
Standard clip	Start clip	End clip	Directional clip	Directional profile

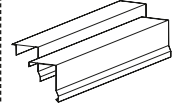
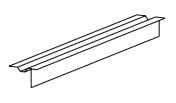
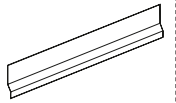
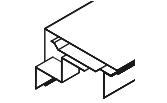
RIB-ROOF METAL ROOFING SYSTEMS

DELIVERY PROGRAM

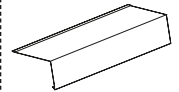
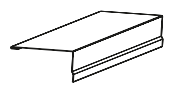
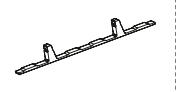
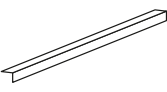
Ridge

Ridge cap	Closure	Profile filler, top side	Ventilation ridge cap	Ventilation closure
				

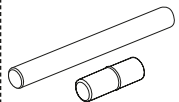
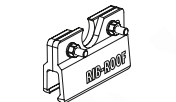
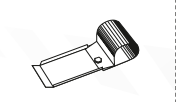

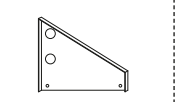

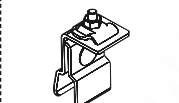

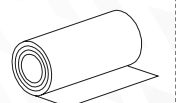
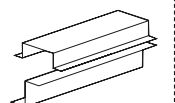
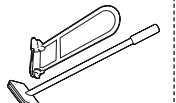
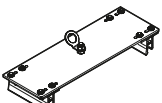
Verge

Cover sheet for verge	Suspended profile	Stopping plate	Variable cover sheet for verge
			

Eaves

Gutter inlet sheet	Eaves panel	Profile filler, rear side	Eaves angle
			

Accessories

Snow guard pipe/pipe connector	Snow guard bracket	Ice stopper, aluminium	Ice catcher, stainless-steel	Snow guard raising element	Solar bracket
					
Bracket for lightning protection	Tread support	Coil material	Flashings	Tools for profiled sheets	Fall arrest system
					

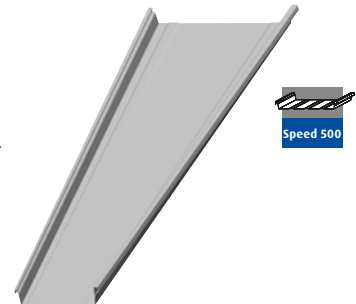
RIB-ROOF METAL ROOFING SYSTEMS

TAPERED, CURVED, TAPERED CURVED PROFILED SHEETS

2.8 TAPERED, CURVED AND TAPERED CURVED PROFILED SHEETS

2.8.1 TAPERED PROFILED SHEETS

RIB-ROOF profiled sheets are also available tapered, curved or tapered curved. Tapered profiled sheets with a minimum construction width of 230 mm and a maximum standard width of 500 mm are executable. Apart from the standard width of 500 mm, we are prepared to manufacture other construction widths, e.g. 333 mm, 400 mm or up to 600 mm as a maximum, upon request.



2.8.2 CURVED PROFILED SHEETS

Depending on the material and material thickness (t in mm) when curving with machines, the following minimum bending radii have to be observed:



Minimum bending radii with RIB-ROOF Speed 500



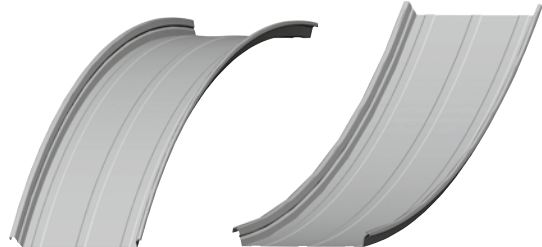
Material	Material thickness t	convex 	concave 
		Radius	Radius
	[mm]	[m]	[m]
Steel	0.63	4.00	10.00
Aluminium	1.00	1.00	10.00
Aluminium	0.90	5.00	10.00
Aluminium	0.80	10.00	-
Titanium zinc	1.00	on request	on request
Copper	0.60	on request	on request

Table of minimum bending radii



Please contact us in advance if you intend to order curved profiled sheets with low bending radii. **RIB-ROOF Speed 500 profiled sheets** with a radius over 100 m will be curved without any machines but forced-curved and installed with standard clips. Turned clips have to be used with radii less than 100 m (installation direction is from right to left).

In general: As the profiled sheets have to be pressed onto the requested radius when carrying out force-curving, waves are possible. Therefore, curving with machines is the optically better solution.

Minimum bending radii with RIB-ROOF 465



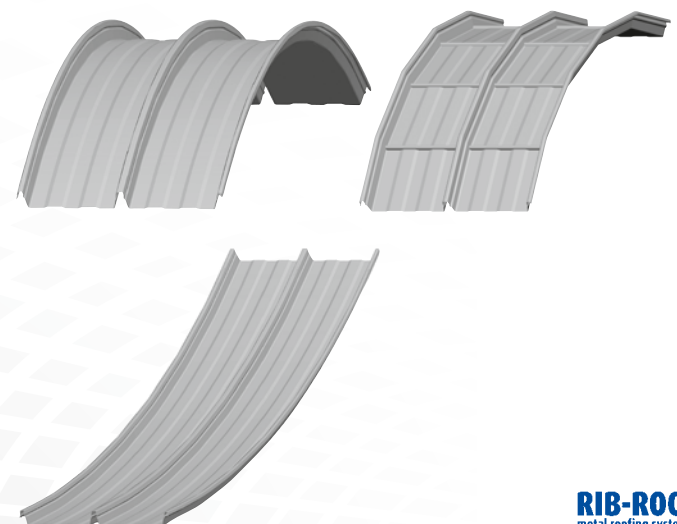
Material	Material thickness t	convex 	concave 
		Radius	Radius
	[mm]	[m]	[m]
Steel	0.63	6.00	20.00
Aluminium	1.00	6.00	20.00
Aluminium	0.90	10.00	20.00
Aluminium	0.80	15.00	-
Titanium zinc	1.00	on request	on request
Copper	0.60	on request	on request

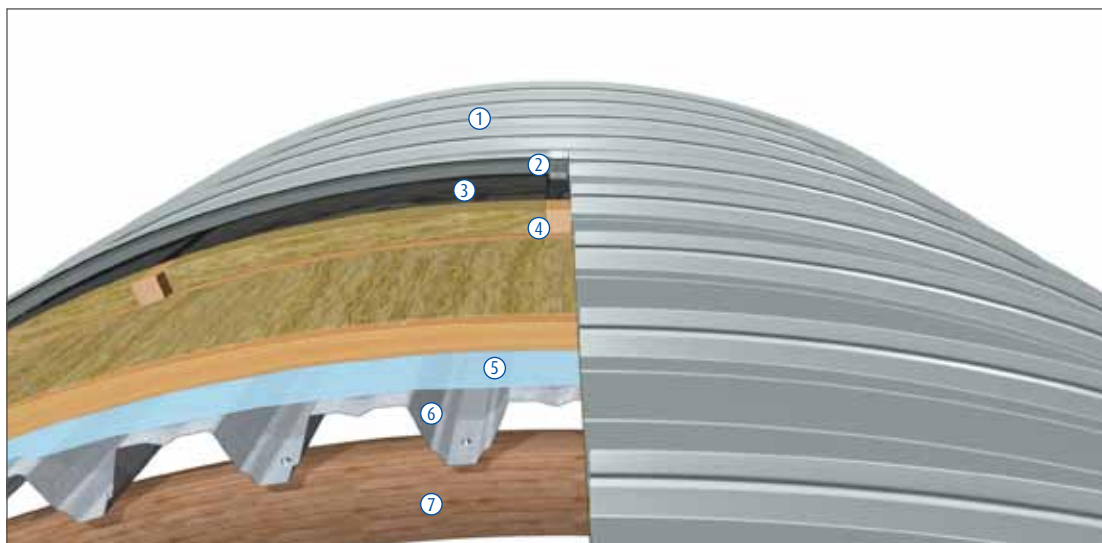
Table of minimum bending radii



Please contact us in advance if you intend to order curved profiled sheets with low bending radii. **RIB-ROOF 465 profiled sheets** can alternatively be forced-curved so that low bending radii are possible. RIB-ROOF 465 profiled sheets can also be curved without any machines with a **radius over 60 m** but forced-curved.

RIB-ROOF METAL ROOFING SYSTEMS

TAPERD, CURVED, TAPERED CURVED PROFILED SHEETS



Radii of $r > 1.0$ m (with RIB-ROOF 465 of $r > 6.0$ m) are possible with wooden counter lathing or metal Z-profiles or hat profiles without transverse lathing each. Low bending radii on request. Radii of more than $r > 8.0$ m are possible with wooden counter/transverse lathing

- ① RIB-ROOF Speed 500
- ② Turned clip, directional clip
- ③ Diffusion-open protective sheet
- ④ Counter/transverse lathing with thermal insulation in between
- ⑤ Vapour barrier membrane
- ⑥ Trapezoidal sheet
- ⑦ Roof truss

2.8.3 TAPERED CURVED PROFILED SHEETS



Please inform us well in advance when intending to carry out projects with tapered curved profiled sheets.



For curved profiled sheets RIB-ROOF Speed 500 with **radii less than 100 m, turned clips/directional clips** have to be used for installation.

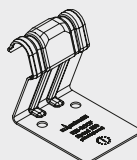
Installation direction is from right to left.

Measurements of screws

(no counter-sunk screws):

Screw head-Ø max. 10.50 mm,

Screw head height max. 5.50 mm



RIB-ROOF METAL ROOFING SYSTEMS

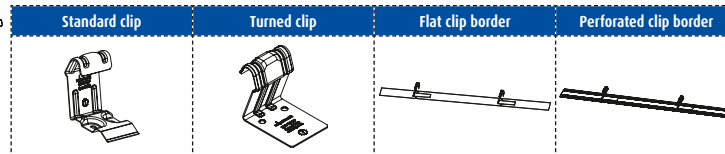
SPANS/CLIP DISTANCES RIB-ROOF SPEED 500

2.9 SPANS/CLIP DISTANCES RIB-ROOF SPEED 500

2.9.1



Speed 500



Wind loads according to DIN EN 1991-1-4/NA		Wind zone 1 inland			Wind zone 2 inland			Wind zone 3 inland			Wind zone 4 inland			
Material	Thick-ness (mm)	Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			max. span limit for access-ibility*
		H	G	F	H	G	F	H	G	F	H	G	F	
		(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	
		$c_{pe,1} = -1.2$	$c_{pe,1} = -2.0$	$c_{pe,1} = -2.5$	$c_{pe,1} = -1.2$	$c_{pe,1} = -2.0$	$c_{pe,1} = -2.5$	$c_{pe,1} = -1.2$	$c_{pe,1} = -2.0$	$c_{pe,1} = -2.5$	$c_{pe,1} = -1.2$	$c_{pe,1} = -2.0$	$c_{pe,1} = -2.5$	

Height of building $h \leq 10.00$ m													
		$q = 0.50$ kN/m ²			$q = 0.65$ kN/m ²			$q = 0.80$ kN/m ²			$q = 0.95$ kN/m ²		
		$w=0.60$ kN/m ²	$w=1.00$ kN/m ²	$w=1.25$ kN/m ²	$w=0.78$ kN/m ²	$w=1.30$ kN/m ²	$w=1.63$ kN/m ²	$w=0.96$ kN/m ²	$w=1.60$ kN/m ²	$w=2.00$ kN/m ²	$w=1.14$ kN/m ²	$w=1.90$ kN/m ²	$w=2.38$ kN/m ²
Steel	0.63	2.32 m	1.39 m	1.11 m	1.78 m	1.07 m	0.86 m	1.45 m	0.87 m	0.70 m	1.22 m	0.73 m	0.59 m
	0.75	2.88 m	1.73 m	1.38 m	2.22 m	1.33 m	1.06 m	1.80 m	1.08 m	0.87 m	1.52 m	0.91 m	0.73 m
Aluminium	0.70	1.72 m	1.03 m	0.82 m	1.32 m	0.79 m	0.63 m	1.07 m	0.64 m	0.52 m	0.90 m	0.54 m	0.43 m
	0.80	2.23 m	1.34 m	1.07 m	1.72 m	1.03 m	0.82 m	1.40 m	0.84 m	0.67 m	1.18 m	0.71 m	0.56 m
	0.90	2.53 m	1.52 m	1.22 m	1.95 m	1.17 m	0.94 m	1.58 m	0.95 m	0.76 m	1.33 m	0.80 m	0.64 m
	1.00	2.83 m	1.70 m	1.36 m	2.18 m	1.31 m	1.05 m	1.77 m	1.06 m	0.85 m	1.49 m	0.89 m	0.72 m

Height of building $h > 10.00$ m ≤ 18.00 m													
		$q = 0.65$ kN/m ²			$q = 0.80$ kN/m ²			$q = 0.95$ kN/m ²			$q = 1.15$ kN/m ²		
		$w=0.78$ kN/m ²	$w=1.30$ kN/m ²	$w=1.63$ kN/m ²	$w=0.96$ kN/m ²	$w=1.60$ kN/m ²	$w=2.00$ kN/m ²	$w=1.14$ kN/m ²	$w=1.90$ kN/m ²	$w=2.38$ kN/m ²	$w=1.38$ kN/m ²	$w=2.30$ kN/m ²	$w=2.88$ kN/m ²
Steel	0.63	1.78 m	1.07 m	0.86 m	1.45 m	0.87 m	0.70 m	1.22 m	0.73 m	0.59 m	1.01 m	0.60 m	0.48 m
	0.75	2.22 m	1.33 m	1.06 m	1.80 m	1.08 m	0.87 m	1.52 m	0.91 m	0.73 m	1.25 m	0.75 m	0.60 m
Aluminium	0.70	1.32 m	0.79 m	0.63 m	1.07 m	0.64 m	0.52 m	0.90 m	0.54 m	0.43 m	0.75 m	0.45 m	0.36 m
	0.80	1.72 m	1.03 m	0.82 m	1.40 m	0.84 m	0.67 m	1.18 m	0.71 m	0.56 m	0.97 m	0.58 m	0.47 m
	0.90	1.95 m	1.17 m	0.94 m	1.58 m	0.95 m	0.76 m	1.33 m	0.80 m	0.64 m	1.10 m	0.66 m	0.53 m
	1.00	2.18 m	1.31 m	1.05 m	1.77 m	1.06 m	0.85 m	1.49 m	0.89 m	0.72 m	1.23 m	0.74 m	0.59 m

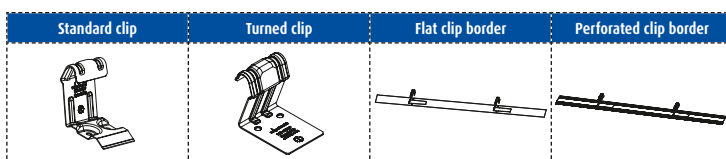
Height of building $h > 18.00$ m ≤ 25.00 m													
		$q = 0.75$ kN/m ²			$q = 0.90$ kN/m ²			$q = 1.10$ kN/m ²			$q = 1.30$ kN/m ²		
		$w=0.90$ kN/m ²	$w=1.50$ kN/m ²	$w=1.88$ kN/m ²	$w=1.08$ kN/m ²	$w=1.80$ kN/m ²	$w=2.25$ kN/m ²	$w=1.32$ kN/m ²	$w=2.20$ kN/m ²	$w=2.75$ kN/m ²	$w=1.56$ kN/m ²	$w=2.60$ kN/m ²	$w=3.25$ kN/m ²
Steel	0.63	1.54 m	0.93 m	0.74 m	1.29 m	0.77 m	0.62 m	1.05 m	0.63 m	0.51 m	0.89 m	0.53 m	0.43 m
	0.75	1.92 m	1.15 m	0.92 m	1.60 m	0.96 m	0.77 m	1.31 m	0.79 m	0.63 m	1.11 m	0.67 m	0.53 m
Aluminium	0.70	1.14 m	0.69 m	0.55 m	0.95 m	0.57 m	0.46 m	0.78 m	0.47 m	0.37 m	0.66 m	0.40 m	0.32 m
	0.80	1.49 m	0.89 m	0.71 m	1.24 m	0.74 m	0.60 m	1.02 m	0.61 m	0.49 m	0.86 m	0.52 m	0.41 m
	0.90	1.69 m	1.01 m	0.81 m	1.41 m	0.84 m	0.68 m	1.15 m	0.69 m	0.55 m	0.97 m	0.58 m	0.47 m
	1.00	1.89 m	1.13 m	0.91 m	1.57 m	0.94 m	0.76 m	1.29 m	0.77 m	0.62 m	1.09 m	0.65 m	0.52 m

* installation-related, e.g. with lathing or Z-profile

Table with spans and clip distances in meter for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

RIB-ROOF METAL ROOFING SYSTEMS

SPANS/CLIP DISTANCES RIB-ROOF SPEED 500



Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea			Wind zone 3 coasts and islands of Baltic Sea			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea			Wind zone 4 islands of North Sea			
Material	Thick- ness (mm)	Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			max. span limit for acces- sibility ^a
		H	G	F	H	G	F	H	G	F	H	G	F	
		(standard area) $c_{pe,1} = -1,2$	(edge area) $c_{pe,1} = -2,0$	(corner area) $c_{pe,1} = -2,5$	(standard area) $c_{pe,1} = -1,2$	(edge area) $c_{pe,1} = -2,0$	(corner area) $c_{pe,1} = -2,5$	(standard area) $c_{pe,1} = -1,2$	(edge area) $c_{pe,1} = -2,0$	(corner area) $c_{pe,1} = -2,5$	(standard area) $c_{pe,1} = -1,2$	(edge area) $c_{pe,1} = -2,0$	(corner area) $c_{pe,1} = -2,5$	

		Height of building $h \leq 10.00$ m												
		$q = 0.85 \text{ kN/m}^2$			$q = 1.05 \text{ kN/m}^2$			$q = 1.25 \text{ kN/m}^2$			$q = 1.40 \text{ kN/m}^2$			
		$w=1.02$ kN/m^2	$w=1.70$ kN/m^2	$w=2.13$ kN/m^2	$w=1.26$ kN/m^2	$w=2.10$ kN/m^2	$w=2.63$ kN/m^2	$w=1.50$ kN/m^2	$w=2.50$ kN/m^2	$w=3.13$ kN/m^2	$w=1.68$ kN/m^2	$w=2.80$ kN/m^2	$w=3.50$ kN/m^2	
Steel	0.63	1.36 m	0.82 m	0.65 m	1.10 m	0.66 m	0.53 m	0.93 m	0.56 m	0.44 m	0.83 m	0.50 m	0.40 m	1.60 m
	0.75	1.70 m	1.02 m	0.81 m	1.37 m	0.82 m	0.66 m	1.15 m	0.69 m	0.55 m	1.03 m	0.62 m	0.49 m	2.40 m
Aluminium	0.70	1.01 m	0.61 m	0.48 m	0.82 m	0.49 m	0.39 m	0.69 m	0.41 m	0.33 m	0.61 m	0.37 m	0.29 m	1.20 m
	0.80	1.31 m	0.79 m	0.63 m	1.06 m	0.64 m	0.51 m	0.89 m	0.54 m	0.43 m	0.80 m	0.48 m	0.38 m	1.50 m
	0.90	1.49 m	0.89 m	0.72 m	1.21 m	0.72 m	0.58 m	1.01 m	0.61 m	0.49 m	0.90 m	0.54 m	0.43 m	1.70 m
	1.00	1.67 m	1.00 m	0.80 m	1.35 m	0.81 m	0.65 m	1.13 m	0.68 m	0.54 m	1.01 m	0.61 m	0.49 m	1.90 m

		Height of building $h > 10.00 \text{ m} \leq 18.00 \text{ m}$									
		$q = 1.00 \text{ kN/m}^2$			$q = 1.20 \text{ kN/m}^2$			$q = 1.40 \text{ kN/m}^2$			
		$w=1.20$ kN/m^2	$w=2.00$ kN/m^2	$w=2.50$ kN/m^2	$w=1.44$ kN/m^2	$w=2.40$ kN/m^2	$w=3.00$ kN/m^2	$w=1.68$ kN/m^2	$w=2.80$ kN/m^2	$w=3.50$ kN/m^2	
Steel	0.63	1.16 m	0.70 m	0.56 m	0.97 m	0.58 m	0.46 m	0.83 m	0.50 m	0.40 m	1.60 m
	0.75	1.44 m	0.87 m	0.69 m	1.20 m	0.72 m	0.58 m	1.03 m	0.62 m	0.49 m	2.40 m
Aluminium	0.70	0.86 m	0.52 m	0.41 m	0.72 m	0.43 m	0.34 m	0.61 m	0.37 m	0.29 m	1.20 m
	0.80	1.12 m	0.67 m	0.54 m	0.93 m	0.56 m	0.45 m	0.80 m	0.48 m	0.38 m	1.50 m
	0.90	1.27 m	0.76 m	0.61 m	1.06 m	0.63 m	0.51 m	0.90 m	0.54 m	0.43 m	1.70 m
	1.00	1.42 m	0.85 m	0.68 m	1.18 m	0.71 m	0.57 m	1.01 m	0.61 m	0.49 m	1.90 m

		Height of building $h > 18.00 \text{ m} \leq 25.00 \text{ m}$									
		$q = 1.10 \text{ kN/m}^2$			$q = 1.30 \text{ kN/m}^2$			$q = 1.55 \text{ kN/m}^2$			
		$w=1.32$ kN/m^2	$w=2.20$ kN/m^2	$w=2.75$ kN/m^2	$w=1.56$ kN/m^2	$w=2.60$ kN/m^2	$w=3.25$ kN/m^2	$w=1.86$ kN/m^2	$w=3.10$ kN/m^2	$w=3.88$ kN/m^2	
Steel	0.63	1.05 m	0.63 m	0.51 m	0.89 m	0.53 m	0.43 m	0.75 m	0.45 m	0.36 m	1.60 m
	0.75	1.31 m	0.79 m	0.63 m	1.11 m	0.67 m	0.53 m	0.93 m	0.56 m	0.45 m	2.40 m
Aluminium	0.70	0.78 m	0.47 m	0.37 m	0.66 m	0.40 m	0.32 m	0.55 m	0.33 m	0.27 m	1.20 m
	0.80	1.02 m	0.61 m	0.49 m	0.86 m	0.52 m	0.41 m	0.72 m	0.43 m	0.35 m	1.50 m
	0.90	1.15 m	0.69 m	0.55 m	0.97 m	0.58 m	0.47 m	0.82 m	0.49 m	0.39 m	1.70 m
	1.00	1.29 m	0.77 m	0.62 m	1.09 m	0.65 m	0.52 m	0.91 m	0.55 m	0.44 m	1.90 m

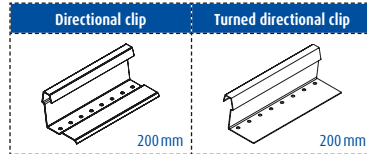
* installation-related, e.g. with lathing or Z-profile

Table with spans and clip distances in meter for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

RIB-ROOF METAL ROOFING SYSTEMS

SPANS/CLIP DISTANCES RIB-ROOF SPEED 500

2.9.2



Wind loads according to DIN EN 1991-1-4/NA		Wind zone 1 inland			Wind zone 2 inland			Wind zone 3 inland			Wind zone 4 inland			
Material	Thick-ness (mm)	Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			max. span limit for access-ibility*
		H	G	F	H	G	F	H	G	F	H	G	F	
		(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	
		$c_{pe,1} = -1,2$	$c_{pe,1} = -2,0$	$c_{pe,1} = -2,5$	$c_{pe,1} = -1,2$	$c_{pe,1} = -2,0$	$c_{pe,1} = -2,5$	$c_{pe,1} = -1,2$	$c_{pe,1} = -2,0$	$c_{pe,1} = -2,5$	$c_{pe,1} = -1,2$	$c_{pe,1} = -2,0$	$c_{pe,1} = -2,5$	

		Height of building $h \leq 10.00$ m												
		q = 0.50 kN/m²			q = 0.65 kN/m²			q = 0.80 kN/m²			q = 0.95 kN/m²			
		w=0.60 kN/m²	w=1.00 kN/m²	w=1.25 kN/m²	w=0.78 kN/m²	w=1.30 kN/m²	w=1.63 kN/m²	w=0.96 kN/m²	w=1.60 kN/m²	w=2.00 kN/m²	w=1.14 kN/m²	w=1.90 kN/m²	w=2.38 kN/m²	
Stahl	0.63	3.83 m	2.30 m	1.84 m	2.95 m	1.77 m	1.42 m	2.40 m	1.44 m	1.15 m	2.02 m	1.21 m	0.97 m	1.60 m
	0.75	3.83 m	2.30 m	1.84 m	2.95 m	1.77 m	1.42 m	2.40 m	1.44 m	1.15 m	2.02 m	1.21 m	0.97 m	2.40 m
Aluminium	0.70	2.35 m	1.41 m	1.13 m	1.81 m	1.08 m	0.87 m	1.47 m	0.88 m	0.71 m	1.24 m	0.74 m	0.59 m	1.20 m
	0.80	3.07 m	1.84 m	1.47 m	2.36 m	1.42 m	1.13 m	1.92 m	1.15 m	0.92 m	1.61 m	0.97 m	0.77 m	1.50 m
	0.90	3.77 m	2.26 m	1.81 m	2.90 m	1.74 m	1.39 m	2.35 m	1.41 m	1.13 m	1.98 m	1.19 m	0.95 m	1.70 m
	1.00	4.35 m	2.61 m	2.09 m	3.35 m	2.01 m	1.61 m	2.72 m	1.63 m	1.31 m	2.29 m	1.37 m	1.10 m	1.90 m

		Height of building $h > 10.00 \text{ m} \leq 18.00 \text{ m}$												
		$q = 0.65 \text{ kN/m}^2$			$q = 0.80 \text{ kN/m}^2$			$q = 0.95 \text{ kN/m}^2$			$q = 1.15 \text{ kN/m}^2$			
		$w=0.78$ kN/m^2	$w=1.30$ kN/m^2	$w=1.63$ kN/m^2	$w=0.96$ kN/m^2	$w=1.60$ kN/m^2	$w=2.00$ kN/m^2	$w=1.14$ kN/m^2	$w=1.90$ kN/m^2	$w=2.38$ kN/m^2	$w=1.38$ kN/m^2	$w=2.30$ kN/m^2	$w=2.88$ kN/m^2	
Stahl	0.63	2.95 m	1.77 m	1.42 m	2.40 m	1.44 m	1.15 m	2.02 m	1.21 m	0.97 m	1.67 m	1.00 m	0.80 m	1.60 m
	0.75	2.95 m	1.77 m	1.42 m	2.40 m	1.44 m	1.15 m	2.02 m	1.21 m	0.97 m	1.67 m	1.00 m	0.80 m	2.40 m
Aluminium	0.70	1.81 m	1.08 m	0.87 m	1.47 m	0.88 m	0.71 m	1.24 m	0.74 m	0.59 m	1.02 m	0.61 m	0.49 m	1.20 m
	0.80	2.36 m	1.42 m	1.13 m	1.92 m	1.15 m	0.92 m	1.61 m	0.97 m	0.77 m	1.33 m	0.80 m	0.64 m	1.50 m
	0.90	2.90 m	1.74 m	1.39 m	2.35 m	1.41 m	1.13 m	1.98 m	1.19 m	0.95 m	1.64 m	0.98 m	0.79 m	1.70 m
	1.00	3.35 m	2.01 m	1.61 m	2.72 m	1.63 m	1.31 m	2.29 m	1.37 m	1.10 m	1.89 m	1.13 m	0.91 m	1.90 m

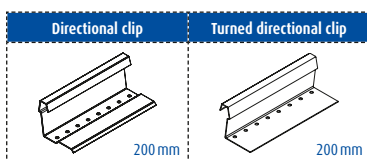
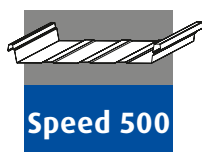
		Height of building $h > 18.00 \text{ m} \leq 25.00 \text{ m}$												
		$q = 0.75 \text{ kN/m}^2$			$q = 0.90 \text{ kN/m}^2$			$q = 1.10 \text{ kN/m}^2$			$q = 1.30 \text{ kN/m}^2$			
		$w=0.90$ kN/m^2	$w=1.50$ kN/m^2	$w=1.88$ kN/m^2	$w=1.08$ kN/m^2	$w=1.80$ kN/m^2	$w=2.25$ kN/m^2	$w=1.32$ kN/m^2	$w=2.20$ kN/m^2	$w=2.75$ kN/m^2	$w=1.56$ kN/m^2	$w=2.60$ kN/m^2	$w=3.25$ kN/m^2	
Stahl	0.63	2.56 m	1.53 m	1.23 m	2.13 m	1.28 m	1.02 m	1.74 m	1.05 m	0.84 m	1.47 m	0.88 m	0.71 m	1.60 m
	0.75	2.56 m	1.53 m	1.23 m	2.13 m	1.28 m	1.02 m	1.74 m	1.05 m	0.84 m	1.47 m	0.88 m	0.71 m	2.40 m
Aluminium	0.70	1.57 m	0.94 m	0.75 m	1.31 m	0.78 m	0.63 m	1.07 m	0.64 m	0.51 m	0.90 m	0.54 m	0.43 m	1.20 m
	0.80	2.04 m	1.23 m	0.98 m	1.70 m	1.02 m	0.82 m	1.39 m	0.84 m	0.67 m	1.18 m	0.71 m	0.57 m	1.50 m
	0.90	2.51 m	1.51 m	1.21 m	2.09 m	1.26 m	1.00 m	1.71 m	1.03 m	0.82 m	1.45 m	0.87 m	0.70 m	1.70 m
	1.00	2.90 m	1.74 m	1.39 m	2.42 m	1.45 m	1.16 m	1.98 m	1.19 m	0.95 m	1.67 m	1.00 m	0.80 m	1.90 m

* installation-related, e.g. with lathing or Z-profile

Table with spans and clip distances in meter for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

RIB-ROOF METAL ROOFING SYSTEMS

SPANS/CLIP DISTANCES RIB-ROOF SPEED 500



Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea			Wind zone 3 coasts and islands of Baltic Sea			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea			Wind zone 4 islands of North Sea			
Material	Thick- ness (mm)	Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			max. span limit for acces- sibility ^a
		H	G	F	H	G	F	H	G	F	H	G	F	
		(standard area) $c_{pe,1} = -1,2$	(edge area) $c_{pe,1} = -2,0$	(corner area) $c_{pe,1} = -2,5$	(standard area) $c_{pe,1} = -1,2$	(edge area) $c_{pe,1} = -2,0$	(corner area) $c_{pe,1} = -2,5$	(standard area) $c_{pe,1} = -1,2$	(edge area) $c_{pe,1} = -2,0$	(corner area) $c_{pe,1} = -2,5$	(standard area) $c_{pe,1} = -1,2$	(edge area) $c_{pe,1} = -2,0$	(corner area) $c_{pe,1} = -2,5$	

		Height of building $h \leq 10.00$ m												
		$q = 0.85 \text{ kN/m}^2$			$q = 1.05 \text{ kN/m}^2$			$q = 1.25 \text{ kN/m}^2$			$q = 1.40 \text{ kN/m}^2$			
		$w=1.02$ kN/m^2	$w=1.70$ kN/m^2	$w=2.13$ kN/m^2	$w=1.26$ kN/m^2	$w=2.10$ kN/m^2	$w=2.63$ kN/m^2	$w=1.50$ kN/m^2	$w=2.50$ kN/m^2	$w=3.13$ kN/m^2	$w=1.68$ kN/m^2	$w=2.80$ kN/m^2	$w=3.50$ kN/m^2	
Stahl	0.63	2.25 m	1.35 m	1.08 m	1.83 m	1.10 m	0.88 m	1.53 m	0.92 m	0.74 m	1.37 m	0.82 m	0.66 m	1.60 m
	0.75	2.25 m	1.35 m	1.08 m	1.83 m	1.10 m	0.88 m	1.53 m	0.92 m	0.74 m	1.37 m	0.82 m	0.66 m	2.40 m
Aluminium	0.70	1.38 m	0.83 m	0.66 m	1.12 m	0.67 m	0.54 m	0.94 m	0.56 m	0.45 m	0.84 m	0.50 m	0.40 m	1.20 m
	0.80	1.80 m	1.08 m	0.87 m	1.46 m	0.88 m	0.70 m	1.23 m	0.74 m	0.59 m	1.10 m	0.66 m	0.53 m	1.50 m
	0.90	2.22 m	1.33 m	1.06 m	1.79 m	1.08 m	0.86 m	1.51 m	0.90 m	0.72 m	1.35 m	0.81 m	0.65 m	1.70 m
	1.00	2.56 m	1.54 m	1.23 m	2.07 m	1.24 m	0.99 m	1.74 m	1.04 m	0.84 m	1.55 m	0.93 m	0.75 m	1.90 m

		Height of building $h > 10.00 \text{ m} \leq 18.00 \text{ m}$									
		$q = 1.00 \text{ kN/m}^2$			$q = 1.20 \text{ kN/m}^2$			$q = 1.40 \text{ kN/m}^2$			
		$w=1.20$ kN/m^2	$w=2.00$ kN/m^2	$w=2.50$ kN/m^2	$w=1.44$ kN/m^2	$w=2.40$ kN/m^2	$w=3.00$ kN/m^2	$w=1.68$ kN/m^2	$w=2.80$ kN/m^2	$w=3.50$ kN/m^2	
Stahl	0.63	1.92 m	1.15 m	0.92 m	1.60 m	0.96 m	0.77 m	1.37 m	0.82 m	0.66 m	1.60 m
	0.75	1.92 m	1.15 m	0.92 m	1.60 m	0.96 m	0.77 m	1.37 m	0.82 m	0.66 m	2.40 m
Aluminium	0.70	1.18 m	0.71 m	0.56 m	0.98 m	0.59 m	0.47 m	0.84 m	0.50 m	0.40 m	1.20 m
	0.80	1.53 m	0.92 m	0.74 m	1.28 m	0.77 m	0.61 m	1.10 m	0.66 m	0.53 m	1.50 m
	0.90	1.88 m	1.13 m	0.90 m	1.57 m	0.94 m	0.75 m	1.35 m	0.81 m	0.65 m	1.70 m
	1.00	2.18 m	1.31 m	1.04 m	1.81 m	1.09 m	0.87 m	1.55 m	0.93 m	0.75 m	1.90 m

		Height of building $h > 18.00 \text{ m} \leq 25.00 \text{ m}$									
		$q = 1.10 \text{ kN/m}^2$			$q = 1.30 \text{ kN/m}^2$			$q = 1.55 \text{ kN/m}^2$			
		$w=1.32$ kN/m^2	$w=2.20$ kN/m^2	$w=2.75$ kN/m^2	$w=1.56$ kN/m^2	$w=2.60$ kN/m^2	$w=3.25$ kN/m^2	$w=1.86$ kN/m^2	$w=3.10$ kN/m^2	$w=3.88$ kN/m^2	
Stahl	0.63	1.74 m	1.05 m	0.84 m	1.47 m	0.88 m	0.71 m	1.24 m	0.74 m	0.59 m	1.60 m
	0.75	1.74 m	1.05 m	0.84 m	1.47 m	0.88 m	0.71 m	1.24 m	0.74 m	0.59 m	2.40 m
Aluminium	0.70	1.07 m	0.64 m	0.51 m	0.90 m	0.54 m	0.43 m	0.76 m	0.45 m	0.36 m	1.20 m
	0.80	1.39 m	0.84 m	0.67 m	1.18 m	0.71 m	0.57 m	0.99 m	0.59 m	0.47 m	1.50 m
	0.90	1.71 m	1.03 m	0.82 m	1.45 m	0.87 m	0.70 m	1.22 m	0.73 m	0.58 m	1.70 m
	1.00	1.98 m	1.19 m	0.95 m	1.67 m	1.00 m	0.80 m	1.40 m	0.84 m	0.67 m	1.90 m

* installation-related, e.g. with lathing or Z-profile

Table with spans and clip distances in meter for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

RIB-ROOF METAL ROOFING SYSTEMS

SPANS/CLIP DISTANCES RIB-ROOF SPEED 500

2.9.3



Wind loads according to DIN EN 1991-1-4/NA	Wind zone 1 inland			Wind zone 2 inland			Wind zone 3 inland			Wind zone 4 inland			
Material Thickness (mm)	Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			max. span limit for accessibility*
	H (standard area) $c_{pe,1} = -1,2$	G (edge area) $c_{pe,1} = -2,0$	F (corner area) $c_{pe,1} = -2,5$	H (standard area) $c_{pe,1} = -1,2$	G (edge area) $c_{pe,1} = -2,0$	F (corner area) $c_{pe,1} = -2,5$	H (standard area) $c_{pe,1} = -1,2$	G (edge area) $c_{pe,1} = -2,0$	F (corner area) $c_{pe,1} = -2,5$	H (standard area) $c_{pe,1} = -1,2$	G (edge area) $c_{pe,1} = -2,0$	F (corner area) $c_{pe,1} = -2,5$	

Height of building $h \leq 10.00$ m													
		$q = 0.50$ kN/m ²			$q = 0.65$ kN/m ²			$q = 0.80$ kN/m ²			$q = 0.95$ kN/m ²		
		$w=0.60$ kN/m ²	$w=1.00$ kN/m ²	$w=1.25$ kN/m ²	$w=0.78$ kN/m ²	$w=1.30$ kN/m ²	$w=1.63$ kN/m ²	$w=0.96$ kN/m ²	$w=1.60$ kN/m ²	$w=2.00$ kN/m ²	$w=1.14$ kN/m ²	$w=1.90$ kN/m ²	$w=2.38$ kN/m ²
Steel	0.63	5.73 m	3.44 m	2.75 m	4.41 m	2.65 m	2.12 m	3.58 m	2.15 m	1.72 m	3.02 m	1.81 m	1.45 m
	0.75	5.73 m	3.44 m	2.75 m	4.41 m	2.65 m	2.12 m	3.58 m	2.15 m	1.72 m	3.02 m	1.81 m	1.45 m
Aluminium	0.70	3.55 m	2.13 m	1.70 m	2.73 m	1.64 m	1.31 m	2.22 m	1.33 m	1.07 m	1.87 m	1.12 m	0.90 m
	0.80	4.63 m	2.78 m	2.22 m	3.56 m	2.14 m	1.71 m	2.90 m	1.74 m	1.39 m	2.44 m	1.46 m	1.17 m
	0.90	5.43 m	3.26 m	2.61 m	4.18 m	2.51 m	2.01 m	3.40 m	2.04 m	1.63 m	2.86 m	1.72 m	1.37 m
	1.00	6.10 m	3.66 m	2.93 m	4.69 m	2.82 m	2.25 m	3.81 m	2.29 m	1.83 m	3.21 m	1.93 m	1.54 m

Height of building $h > 10.00$ m ≤ 18.00 m													
		$q = 0.65$ kN/m ²			$q = 0.80$ kN/m ²			$q = 0.95$ kN/m ²			$q = 1.15$ kN/m ²		
		$w=0.78$ kN/m ²	$w=1.30$ kN/m ²	$w=1.63$ kN/m ²	$w=0.96$ kN/m ²	$w=1.60$ kN/m ²	$w=2.00$ kN/m ²	$w=1.14$ kN/m ²	$w=1.90$ kN/m ²	$w=2.38$ kN/m ²	$w=1.38$ kN/m ²	$w=2.30$ kN/m ²	$w=2.88$ kN/m ²
Steel	0.63	4.41 m	2.65 m	2.12 m	3.58 m	2.15 m	1.72 m	3.02 m	1.81 m	1.45 m	2.49 m	1.50 m	1.20 m
	0.75	4.41 m	2.65 m	2.12 m	3.58 m	2.15 m	1.72 m	3.02 m	1.81 m	1.45 m	2.49 m	1.50 m	1.20 m
Aluminium	0.70	2.73 m	1.64 m	1.31 m	2.22 m	1.33 m	1.07 m	1.87 m	1.12 m	0.90 m	1.54 m	0.93 m	0.74 m
	0.80	3.56 m	2.14 m	1.71 m	2.90 m	1.74 m	1.39 m	2.44 m	1.46 m	1.17 m	2.01 m	1.21 m	0.97 m
	0.90	4.18 m	2.51 m	2.01 m	3.40 m	2.04 m	1.63 m	2.86 m	1.72 m	1.37 m	2.36 m	1.42 m	1.13 m
	1.00	4.69 m	2.82 m	2.25 m	3.81 m	2.29 m	1.83 m	3.21 m	1.93 m	1.54 m	2.65 m	1.59 m	1.27 m

Height of building $h > 18.00$ m ≤ 25.00 m													
		$q = 0.75$ kN/m ²			$q = 0.90$ kN/m ²			$q = 1.10$ kN/m ²			$q = 1.30$ kN/m ²		
		$w=0.90$ kN/m ²	$w=1.50$ kN/m ²	$w=1.88$ kN/m ²	$w=1.08$ kN/m ²	$w=1.80$ kN/m ²	$w=2.25$ kN/m ²	$w=1.32$ kN/m ²	$w=2.20$ kN/m ²	$w=2.75$ kN/m ²	$w=1.56$ kN/m ²	$w=2.60$ kN/m ²	$w=3.25$ kN/m ²
Steel	0.63	3.82 m	2.29 m	1.83 m	3.19 m	1.91 m	1.53 m	2.61 m	1.56 m	1.25 m	2.21 m	1.32 m	1.06 m
	0.75	3.82 m	2.29 m	1.83 m	3.19 m	1.91 m	1.53 m	2.61 m	1.56 m	1.25 m	2.21 m	1.32 m	1.06 m
Aluminium	0.70	2.37 m	1.42 m	1.14 m	1.97 m	1.18 m	0.95 m	1.61 m	0.97 m	0.77 m	1.37 m	0.82 m	0.66 m
	0.80	3.09 m	1.85 m	1.48 m	2.57 m	1.54 m	1.24 m	2.11 m	1.26 m	1.01 m	1.78 m	1.07 m	0.86 m
	0.90	3.62 m	2.17 m	1.74 m	3.02 m	1.81 m	1.45 m	2.47 m	1.48 m	1.19 m	2.09 m	1.25 m	1.00 m
	1.00	4.07 m	2.44 m	1.95 m	3.39 m	2.03 m	1.63 m	2.77 m	1.66 m	1.33 m	2.35 m	1.41 m	1.13 m

* installation-related, e.g. with lathing or Z-profile

Table with spans and clip distances in meter for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

RIB-ROOF METAL ROOFING SYSTEMS

SPANS/CLIP DISTANCES RIB-ROOF SPEED 500



Wind loads according to DIN EN 1991-1-4/NA	Wind zone 2 coasts and islands of Baltic Sea	Wind zone 3 coasts and islands of Baltic Sea	Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea	Wind zone 4 islands of North Sea	
Material Thickness (mm)	Clip distance (m) with H (standard area) G (edge area) F (corner area) $c_{pe,1} = -1,2$ $c_{pe,1} = -2,0$ $c_{pe,1} = -2,5$	Clip distance (m) with H (standard area) G (edge area) F (corner area) $c_{pe,1} = -1,2$ $c_{pe,1} = -2,0$ $c_{pe,1} = -2,5$	Clip distance (m) with H (standard area) G (edge area) F (corner area) $c_{pe,1} = -1,2$ $c_{pe,1} = -2,0$ $c_{pe,1} = -2,5$	Clip distance (m) with H (standard area) G (edge area) F (corner area) $c_{pe,1} = -1,2$ $c_{pe,1} = -2,0$ $c_{pe,1} = -2,5$	max. span limit for accessibility ²

		Height of building $h \leq 10.00$ m												
		$q = 0.85 \text{ kN/m}^2$			$q = 1.05 \text{ kN/m}^2$			$q = 1.25 \text{ kN/m}^2$			$q = 1.40 \text{ kN/m}^2$			
		$w=1.02$ kN/m^2	$w=1.70$ kN/m^2	$w=2.13$ kN/m^2	$w=1.26$ kN/m^2	$w=2.10$ kN/m^2	$w=2.63$ kN/m^2	$w=1.50$ kN/m^2	$w=2.50$ kN/m^2	$w=3.13$ kN/m^2	$w=1.68$ kN/m^2	$w=2.80$ kN/m^2	$w=3.50$ kN/m^2	
Steel	0.63	3.37 m	2.02 m	1.62 m	2.73 m	1.64 m	1.31 m	2.29 m	1.38 m	1.10 m	2.05 m	1.23 m	0.98 m	1.60 m
	0.75	3.37 m	2.02 m	1.62 m	2.73 m	1.64 m	1.31 m	2.29 m	1.38 m	1.10 m	2.05 m	1.23 m	0.98 m	2.40 m
Aluminium	0.70	2.09 m	1.25 m	1.00 m	1.69 m	1.01 m	0.81 m	1.42 m	0.85 m	0.68 m	1.27 m	0.76 m	0.61 m	1.20 m
	0.80	2.73 m	1.64 m	1.31 m	2.21 m	1.32 m	1.06 m	1.85 m	1.11 m	0.89 m	1.65 m	0.99 m	0.79 m	1.50 m
	0.90	3.20 m	1.92 m	1.53 m	2.59 m	1.55 m	1.24 m	2.17 m	1.30 m	1.04 m	1.94 m	1.16 m	0.93 m	1.70 m
	1.00	3.59 m	2.15 m	1.72 m	2.90 m	1.74 m	1.39 m	2.44 m	1.46 m	1.17 m	2.18 m	1.31 m	1.05 m	1.90 m

		Height of building $h > 10.00 \text{ m} \leq 18.00 \text{ m}$									
		$q = 1.00 \text{ kN/m}^2$			$q = 1.20 \text{ kN/m}^2$			$q = 1.40 \text{ kN/m}^2$			
		$w=1.20$ kN/m^2	$w=2.00$ kN/m^2	$w=2.50$ kN/m^2	$w=1.44$ kN/m^2	$w=2.40$ kN/m^2	$w=3.00$ kN/m^2	$w=1.68$ kN/m^2	$w=2.80$ kN/m^2	$w=3.50$ kN/m^2	
Steel	0.63	2.87 m	1.72 m	1.38 m	2.39 m	1.43 m	1.15 m	2.05 m	1.23 m	0.98 m	1.60 m
	0.75	2.87 m	1.72 m	1.38 m	2.39 m	1.43 m	1.15 m	2.05 m	1.23 m	0.98 m	2.40 m
Aluminium	0.70	1.78 m	1.07 m	0.85 m	1.48 m	0.89 m	0.71 m	1.27 m	0.76 m	0.61 m	1.20 m
	0.80	2.32 m	1.39 m	1.11 m	1.93 m	1.16 m	0.93 m	1.65 m	0.99 m	0.79 m	1.50 m
	0.90	2.72 m	1.63 m	1.30 m	2.26 m	1.36 m	1.09 m	1.94 m	1.16 m	0.93 m	1.70 m
	1.00	3.05 m	1.83 m	1.46 m	2.54 m	1.53 m	1.22 m	2.18 m	1.31 m	1.05 m	1.90 m

		Height of building $h > 18.00 \text{ m} \leq 25.00 \text{ m}$									
		$q = 1.10 \text{ kN/m}^2$			$q = 1.30 \text{ kN/m}^2$			$q = 1.55 \text{ kN/m}^2$			
		$w=1.32$ kN/m^2	$w=2.20$ kN/m^2	$w=2.75$ kN/m^2	$w=1.56$ kN/m^2	$w=2.60$ kN/m^2	$w=3.25$ kN/m^2	$w=1.86$ kN/m^2	$w=3.10$ kN/m^2	$w=3.88$ kN/m^2	
Steel	0.63	2.61 m	1.56 m	1.25 m	2.21 m	1.32 m	1.06 m	1.85 m	1.11 m	0.89 m	1.60 m
	0.75	2.61 m	1.56 m	1.25 m	2.21 m	1.32 m	1.06 m	1.85 m	1.11 m	0.89 m	2.40 m
Aluminium	0.70	1.61 m	0.97 m	0.77 m	1.37 m	0.82 m	0.66 m	1.15 m	0.69 m	0.55 m	1.20 m
	0.80	2.11 m	1.26 m	1.01 m	1.78 m	1.07 m	0.86 m	1.49 m	0.90 m	0.72 m	1.50 m
	0.90	2.47 m	1.48 m	1.19 m	2.09 m	1.25 m	1.00 m	1.75 m	1.05 m	0.84 m	1.70 m
	1.00	2.77 m	1.66 m	1.33 m	2.35 m	1.41 m	1.13 m	1.97 m	1.18 m	0.94 m	1.90 m

* installation-related, e.g. with lathing or Z-profile

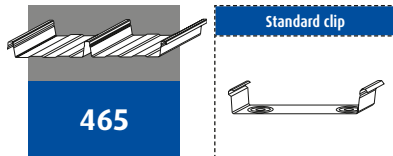
Table with spans and clip distances in meter for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

RIB-ROOF METAL ROOFING SYSTEMS

SPANS/CLIP DISTANCES RIB-ROOF 465

2.10 SPANS/CLIP DISTANCES RIB-ROOF 465

2.10.1



Wind loads according to DIN EN 1991-1-4/NA		Wind zone 1 inland			Wind zone 2 inland			Wind zone 3 inland			Wind zone 4 inland			
Material	Thick-ness (mm)	Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			max. span limit for acces-sibility*
		H	G	F	H	G	F	H	G	F	H	G	F	
		(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	
		c _{pe,1} = -1,2	c _{pe,1} = -2,0	c _{pe,1} = -2,5	c _{pe,1} = -1,2	c _{pe,1} = -2,0	c _{pe,1} = -2,5	c _{pe,1} = -1,2	c _{pe,1} = -2,0	c _{pe,1} = -2,5	c _{pe,1} = -1,2	c _{pe,1} = -2,0	c _{pe,1} = -2,5	

		Height of building $h \leq 10.00$ m												
		q = 0.50 kN/m ²			q = 0.65 kN/m ²			q = 0.80 kN/m ²			q = 0.95 kN/m ²			
		w=0.60 kN/m ²	w=1.00 kN/m ²	w=1.25 kN/m ²	w=0.78 kN/m ²	w=1.30 kN/m ²	w=1.63 kN/m ²	w=0.96 kN/m ²	w=1.60 kN/m ²	w=2.00 kN/m ²	w=1.14 kN/m ²	w=1.90 kN/m ²	w=2.38 kN/m ²	
Steel	0.63	3.71 m	2.23 m	1.78 m	2.85 m	1.71 m	1.37 m	2.32 m	1.39 m	1.11 m	1.95 m	1.17 m	0.94 m	1.60 m
	0.75	4.21 m	2.53 m	2.02 m	3.24 m	1.94 m	1.55 m	2.63 m	1.58 m	1.26 m	2.21 m	1.33 m	1.06 m	2.40 m
Aluminium	0.70	1.51 m	0.91 m	0.72 m	1.16 m	0.70 m	0.56 m	0.94 m	0.57 m	0.45 m	0.79 m	0.48 m	0.38 m	1.20 m
	0.80	1.97 m	1.18 m	0.94 m	1.51 m	0.91 m	0.73 m	1.23 m	0.74 m	0.59 m	1.04 m	0.62 m	0.50 m	1.50 m
	0.90	2.21 m	1.33 m	1.06 m	1.70 m	1.02 m	0.82 m	1.38 m	0.83 m	0.66 m	1.16 m	0.70 m	0.56 m	1.70 m
	1.00	2.46 m	1.48 m	1.18 m	1.89 m	1.13 m	0.91 m	1.54 m	0.92 m	0.74 m	1.29 m	0.78 m	0.62 m	1.90 m

		Height of building $h > 10.00 \text{ m} \leq 18.00 \text{ m}$												
		$q = 0.65 \text{ kN/m}^2$			$q = 0.80 \text{ kN/m}^2$			$q = 0.95 \text{ kN/m}^2$			$q = 1.15 \text{ kN/m}^2$			
		$w=0.78$ kN/m^2	$w=1.30$ kN/m^2	$w=1.63$ kN/m^2	$w=0.96$ kN/m^2	$w=1.60$ kN/m^2	$w=2.00$ kN/m^2	$w=1.14$ kN/m^2	$w=1.90$ kN/m^2	$w=2.38$ kN/m^2	$w=1.38$ kN/m^2	$w=2.30$ kN/m^2	$w=2.88$ kN/m^2	
Steel	0.63	2.85 m	1.71 m	1.37 m	2.32 m	1.39 m	1.11 m	1.95 m	1.17 m	0.94 m	1.61 m	0.97 m	0.77 m	1.60 m
	0.75	3.24 m	1.94 m	1.55 m	2.63 m	1.58 m	1.26 m	2.21 m	1.33 m	1.06 m	1.83 m	1.10 m	0.88 m	2.40 m
Aluminium	0.70	1.16 m	0.70 m	0.56 m	0.94 m	0.57 m	0.45 m	0.79 m	0.48 m	0.38 m	0.66 m	0.39 m	0.31 m	1.20 m
	0.80	1.51 m	0.91 m	0.73 m	1.23 m	0.74 m	0.59 m	1.04 m	0.62 m	0.50 m	0.86 m	0.51 m	0.41 m	1.50 m
	0.90	1.70 m	1.02 m	0.82 m	1.38 m	0.83 m	0.66 m	1.16 m	0.70 m	0.56 m	0.96 m	0.58 m	0.46 m	1.70 m
	1.00	1.89 m	1.13 m	0.91 m	1.54 m	0.92 m	0.74 m	1.29 m	0.78 m	0.62 m	1.07 m	0.64 m	0.51 m	1.90 m

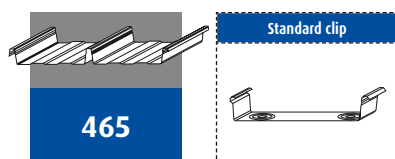
		Height of building $h > 18.00\text{ m} \leq 25.00\text{ m}$												
		$q = 0.75\text{ kN/m}^2$			$q = 0.90\text{ kN/m}^2$			$q = 1.10\text{ kN/m}^2$			$q = 1.30\text{ kN/m}^2$			
		$w=0.90$ kN/m^2	$w=1.50$ kN/m^2	$w=1.88$ kN/m^2	$w=1.08$ kN/m^2	$w=1.80$ kN/m^2	$w=2.25$ kN/m^2	$w=1.32$ kN/m^2	$w=2.20$ kN/m^2	$w=2.75$ kN/m^2	$w=1.56$ kN/m^2	$w=2.60$ kN/m^2	$w=3.25$ kN/m^2	
Steel	0.63	2.47 m	1.48 m	1.19 m	2.06 m	1.24 m	0.99 m	1.69 m	1.01 m	0.81 m	1.43 m	0.86 m	0.68 m	1.60 m
	0.75	2.81 m	1.68 m	1.35 m	2.34 m	1.40 m	1.12 m	1.91 m	1.15 m	0.92 m	1.62 m	0.97 m	0.78 m	2.40 m
Aluminium	0.70	1.01 m	0.60 m	0.48 m	0.84 m	0.50 m	0.40 m	0.69 m	0.41 m	0.33 m	0.58 m	0.35 m	0.28 m	1.20 m
	0.80	1.31 m	0.79 m	0.63 m	1.09 m	0.66 m	0.52 m	0.89 m	0.54 m	0.43 m	0.76 m	0.45 m	0.36 m	1.50 m
	0.90	1.47 m	0.88 m	0.71 m	1.23 m	0.74 m	0.59 m	1.00 m	0.60 m	0.48 m	0.85 m	0.51 m	0.41 m	1.70 m
	1.00	1.64 m	0.98 m	0.79 m	1.37 m	0.82 m	0.66 m	1.12 m	0.67 m	0.54 m	0.95 m	0.57 m	0.45 m	1.90 m

* installation-related, e.g. with lathing or Z-profile

Table with spans and clip distances in meter for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

RIB-ROOF METAL ROOFING SYSTEMS

SPANS/CLIP DISTANCES RIB-ROOF 465



Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea			Wind zone 3 coasts and islands of Baltic Sea			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea			Wind zone 4 islands of North Sea			
Material	Thick- ness (mm)	Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			max. span limit for acces- sibility ^a
		H	G	F	H	G	F	H	G	F	H	G	F	
		(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	(standard area)	(edge area)	(corner area)	
		$c_{pe,1} = 1,2$	$c_{pe,1} = -2,0$	$c_{pe,1} = -2,5$	$c_{pe,1} = 1,2$	$c_{pe,1} = -2,0$	$c_{pe,1} = -2,5$	$c_{pe,1} = 1,2$	$c_{pe,1} = -2,0$	$c_{pe,1} = -2,5$	$c_{pe,1} = 1,2$	$c_{pe,1} = -2,0$	$c_{pe,1} = -2,5$	

		Height of building $h \leq 10.00$ m												
		$q = 0.85 \text{ kN/m}^2$			$q = 1.05 \text{ kN/m}^2$			$q = 1.25 \text{ kN/m}^2$			$q = 1.40 \text{ kN/m}^2$			
		$w=1.02$ kN/m^2	$w=1.70$ kN/m^2	$w=2.13$ kN/m^2	$w=1.26$ kN/m^2	$w=2.10$ kN/m^2	$w=2.63$ kN/m^2	$w=1.50$ kN/m^2	$w=2.50$ kN/m^2	$w=3.13$ kN/m^2	$w=1.68$ kN/m^2	$w=2.80$ kN/m^2	$w=3.50$ kN/m^2	
Steel	0.63	2.18 m	1.31 m	1.05 m	1.77 m	1.06 m	0.85 m	1.48 m	0.89 m	0.71 m	1.32 m	0.79 m	0.64 m	1.60 m
	0.75	2.48 m	1.49 m	1.19 m	2.00 m	1.20 m	0.96 m	1.68 m	1.01 m	0.81 m	1.50 m	0.90 m	0.72 m	2.40 m
Aluminium	0.70	0.89 m	0.53 m	0.43 m	0.72 m	0.43 m	0.34 m	0.60 m	0.36 m	0.29 m	0.54 m	0.32 m	0.26 m	1.20 m
	0.80	1.16 m	0.69 m	0.56 m	0.94 m	0.56 m	0.45 m	0.79 m	0.47 m	0.38 m	0.70 m	0.42 m	0.34 m	1.50 m
	0.90	1.30 m	0.78 m	0.62 m	1.05 m	0.63 m	0.50 m	0.88 m	0.53 m	0.42 m	0.79 m	0.47 m	0.38 m	1.70 m
	1.00	1.45 m	0.87 m	0.69 m	1.17 m	0.70 m	0.56 m	0.98 m	0.59 m	0.47 m	0.88 m	0.53 m	0.42 m	1.90 m

		Height of building $h > 10.00 \text{ m} \leq 18.00 \text{ m}$									
		$q = 1.00 \text{ kN/m}^2$			$q = 1.20 \text{ kN/m}^2$			$q = 1.40 \text{ kN/m}^2$			
		$w=1.20$ kN/m^2	$w=2.00$ kN/m^2	$w=2.50$ kN/m^2	$w=1.44$ kN/m^2	$w=2.40$ kN/m^2	$w=3.00$ kN/m^2	$w=1.68$ kN/m^2	$w=2.80$ kN/m^2	$w=3.50$ kN/m^2	
Steel	0.63	1.85 m	1.11 m	0.89 m	1.55 m	0.93 m	0.74 m	1.32 m	0.79 m	0.64 m	1.60 m
	0.75	2.10 m	1.26 m	1.01 m	1.75 m	1.05 m	0.84 m	1.50 m	0.90 m	0.72 m	2.40 m
Aluminium	0.70	0.75 m	0.45 m	0.36 m	0.63 m	0.38 m	0.30 m	0.54 m	0.32 m	0.26 m	1.20 m
	0.80	0.98 m	0.59 m	0.47 m	0.82 m	0.49 m	0.39 m	0.70 m	0.42 m	0.34 m	1.50 m
	0.90	1.10 m	0.66 m	0.53 m	0.92 m	0.55 m	0.44 m	0.79 m	0.47 m	0.38 m	1.70 m
	1.00	1.23 m	0.74 m	0.59 m	1.02 m	0.61 m	0.49 m	0.88 m	0.53 m	0.42 m	1.90 m

		Height of building $h > 18.00 \text{ m} \leq 25.00 \text{ m}$									
		$q = 1.10 \text{ kN/m}^2$			$q = 1.30 \text{ kN/m}^2$			$q = 1.55 \text{ kN/m}^2$			
		$w=1.32 \text{ kN/m}^2$	$w=2.20 \text{ kN/m}^2$	$w=2.75 \text{ kN/m}^2$	$w=1.56 \text{ kN/m}^2$	$w=2.60 \text{ kN/m}^2$	$w=3.25 \text{ kN/m}^2$	$w=1.86 \text{ kN/m}^2$	$w=3.10 \text{ kN/m}^2$	$w=3.88 \text{ kN/m}^2$	
Steel	0.63	1.69 m	1.01 m	0.81 m	1.43 m	0.86 m	0.68 m	1.20 m	0.72 m	0.57 m	1.60 m
	0.75	1.91 m	1.15 m	0.92 m	1.62 m	0.97 m	0.78 m	1.36 m	0.81 m	0.65 m	2.40 m
Aluminium	0.70	0.69 m	0.41 m	0.33 m	0.58 m	0.35 m	0.28 m	0.49 m	0.29 m	0.23 m	1.20 m
	0.80	0.89 m	0.54 m	0.43 m	0.76 m	0.45 m	0.36 m	0.63 m	0.38 m	0.30 m	1.50 m
	0.90	1.00 m	0.60 m	0.48 m	0.85 m	0.51 m	0.41 m	0.71 m	0.43 m	0.34 m	1.70 m
	1.00	1.12 m	0.67 m	0.54 m	0.95 m	0.57 m	0.45 m	0.79 m	0.48 m	0.38 m	1.90 m

* installation-related, e.g. with lathing or Z-profile

Table with spans and clip distances in meter for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

RIB-ROOF METAL ROOFING SYSTEMS

SPANS, CLIP DISTANCES

Span limits with titanium zinc and copper

The maximum span limit of accessibility with titanium zinc is 0.60 m for single-span and multi-span supports. Fully-supported or appropriate substructures are necessary. The maximum span limit of accessibility with copper is 1.20 m.

We support you when determining object-related clip distances (or span limits). The extraction value of the chosen fixing element in each substructure has to be checked. Please contact us.

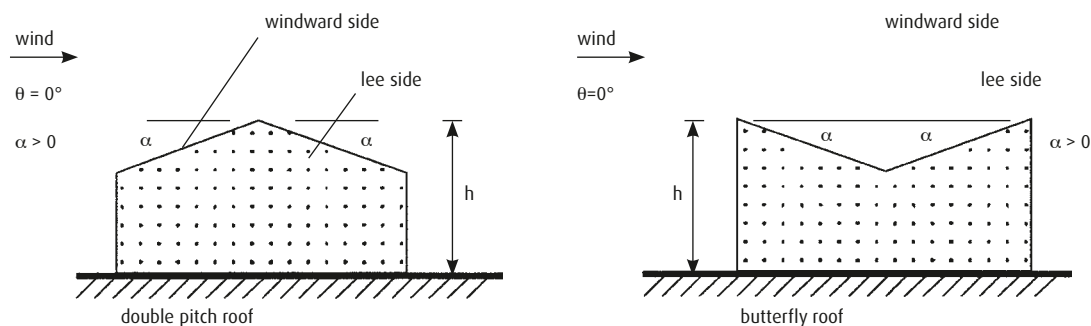
Extract of DIN EN 1991-1-4:2010-12, EN 1991-1-4:2005 + A1:2010 + AC:2010 (D)

Picture 7.8 – dividing of roof area with double pitch and butterfly roofs

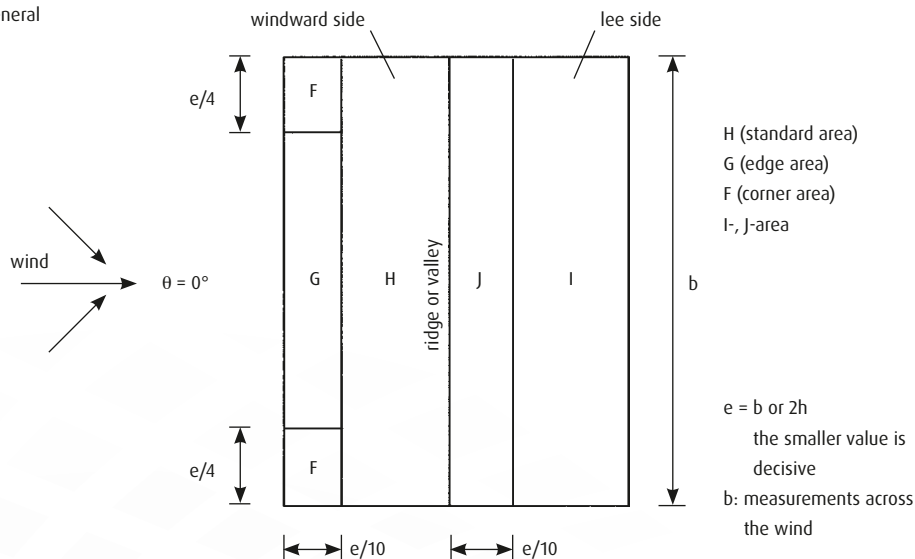
Wind loads according to DIN EN 1991-1-4

The wind loads have been set according to DIN EN 1991-1-4, (version 2010-12), table 7.4 – external pressure coefficient for double pitch roof with a slope up to 5° for enclosed halls, H (normal area) with c_{pe} , 1=-1.2. For the evidence of the fixing element connection higher wind load coefficients for G (side areas) with c_{pe} , 1=-2.0 and F (edge area) with c_{pe} , 1=-2.5 have been considered in addition.

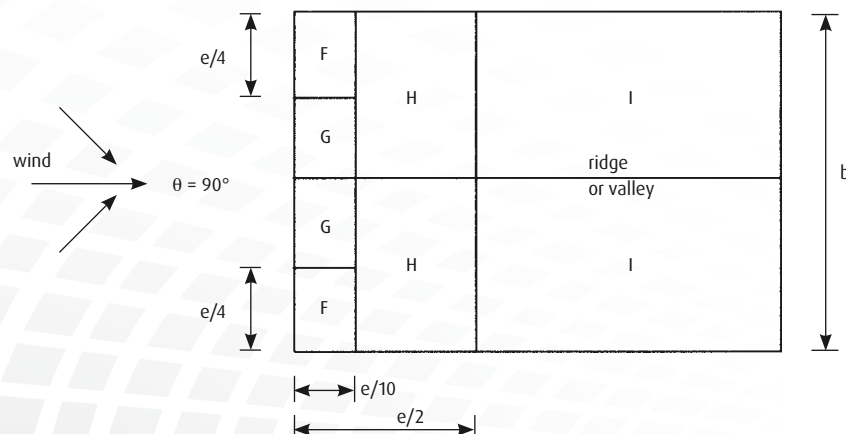
Depending on the building geometry according to DIN EN 1991-1-4, image 7.8 the width of G (side areas) and F (edge area) $e/10$ and a length of F (edge area) $e/4$, in which for $e=b$ or $2/h$ the minor value is decisive.



(a) in general



(b) direction of flow $\theta = 0^\circ$
or (c) direction of flow $\theta = 90^\circ$

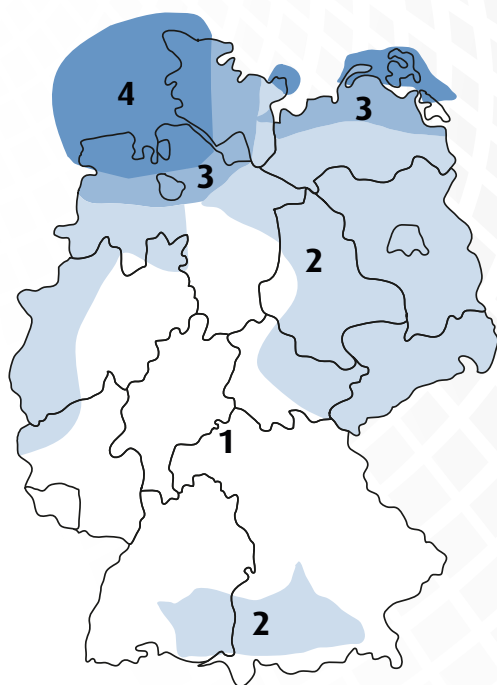


RIB-ROOF METAL ROOFING SYSTEMS

SPANS, CLIP DISTANCES



RIB-ROOF METAL ROOFING SYSTEMS



Wind zone	$v_{b,0}$	$q_{b,0}$
WZ 1	22.5 m/s	0.32 kN/m ²
WZ 2	25.0 m/s	0.39 kN/m ²
WZ 3	27.5 m/s	0.47 kN/m ²
WZ 4	30.0 m/s	0.56 kN/m ²

The use of our directional clips and profiles RIB-ROOF Speed 500 is recommended in wind zones 3 and 4.

Contact us.



INSTALLATION TECHNIQUE

RIB-ROOF SPEED 500

3.1 RIB-ROOF SPEED 500

3.1.1 INSTALLATION WITH SLIDING CLIPS

STRAIGHT PROFILED SHEETS WITH STANDARD CLIP/DIRECTIONAL CLIP



Film of installation principle RIB-ROOF SPEED 500

Discover within two minutes how to install RIB-ROOF Speed 500 with straight profiled sheets and standard clips.

<http://install-speed500.zambelli.de>

1. Place the first row of clips

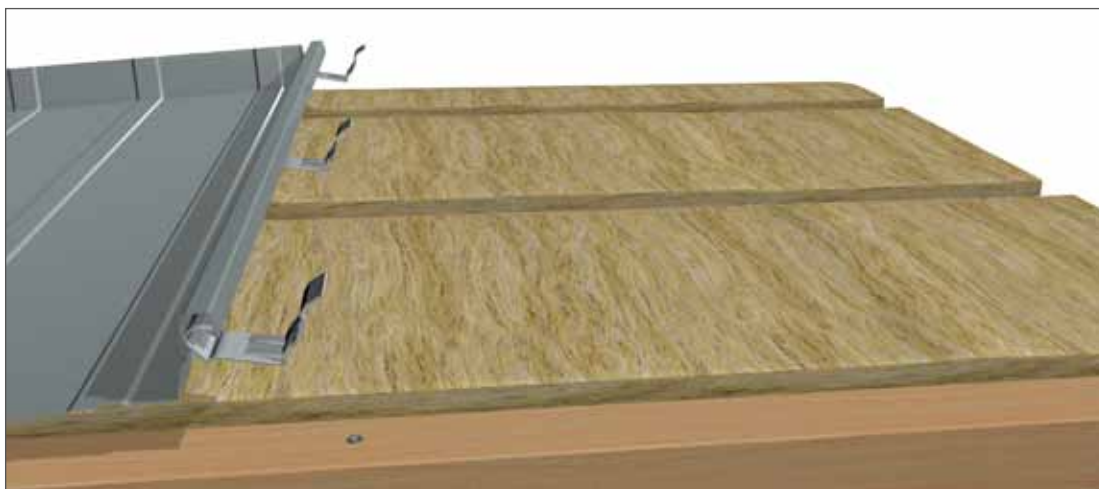
Align the clips (fixing elements) along the verge and fasten them with **rivets or screws which are approved by Building Authorities** (chapter 1.3.2) on the substructure. Additional pre-assembling isn't necessary. The clip distances depend on data specifically for

each building and wind load (refer to chapter 2.7). Please pay attention to the fact that clips have to be fastened only with screws which are fully-threaded.

2. Insert the first profiled sheet and place next row of clips

Push the small rib of the first profiled sheet into the clips. Then swivel the profiled sheet onto the substructure. **Each profiled sheet is going to be secured with a fixed point in order to avoid sliding**

down (refer to chapter 3.1.3). The folding up or down of bottom booms can be done either at our factory or on site.



The position of the sliding clips (standard clips/directional clips) is determined by the profiled sheet width.

The position of the next row of clips results from the width of the profiled sheet. Therefore, pre-assembling and aligning of clips by means of plumb lines isn't necessary. Insert the sliding clip with a simple turn of the hand into the large rib. Then swivel, click into the rib and fasten it on the substructure.



The sliding clip clicks into the rib and now, it can be fastened.

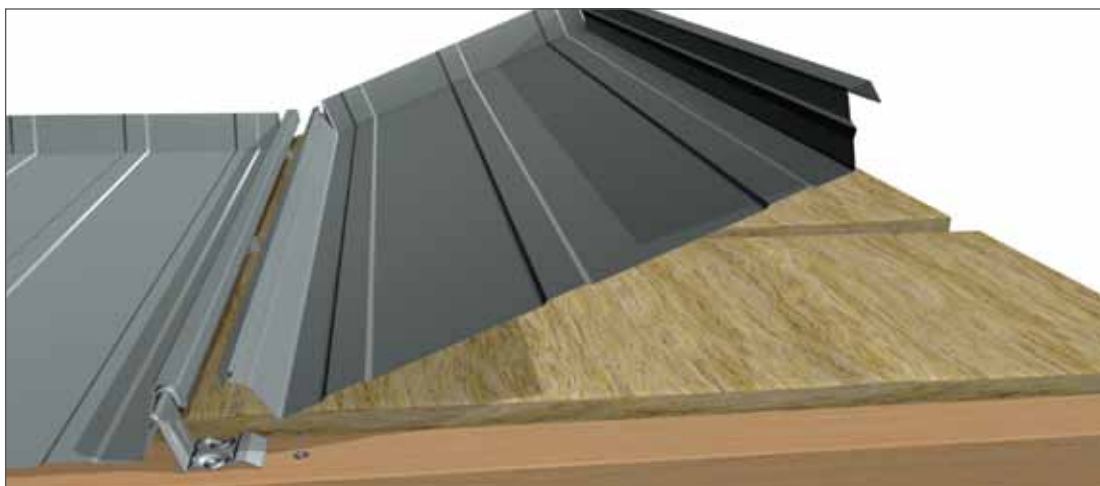
INSTALLATION TECHNIQUE

RIB-ROOF SPEED 500

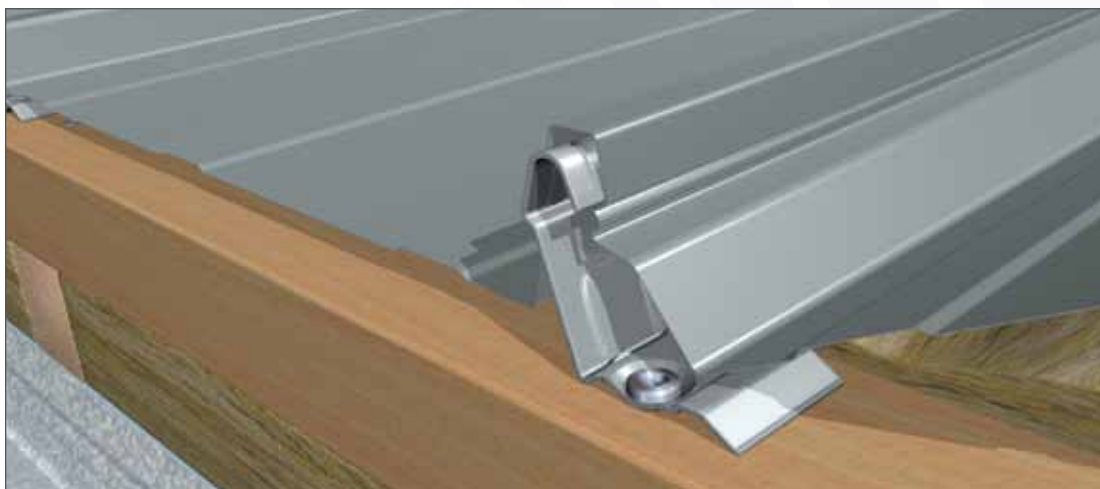
3. Insert the next profiled sheet

Swivel the next profiled sheet with its small rib under the clip and the large seam. Then swivel downwards and click-into-place (clip). Time-consuming zipping of profiled sheets isn't necessary.

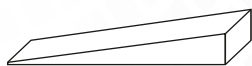
RIB-ROOF Speed 500 is reinforced in the eaves by joining the bottom booms to an eaves angle. (chapter 4.3).



The second profiled sheet is swivelled under the sliding clip...



... and through the clicking-into-place mechanism, a permanent profiled sheet connection is guaranteed.



If the RIB-ROOF Speed 500 profiled sheets eventually have to be opened after installation (e.g. when fitting in roof penetrations later), you can do so by using a wedge out of hard plastics (available from Zambelli).

INSTALLATION TECHNIQUE

RIB-ROOF SPEED 500

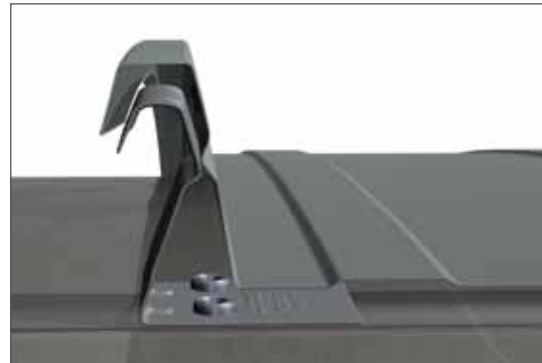
CURVED PROFILED SHEETS WITH TURNED SLIDING CLIP



Film of installation principle RIB-ROOF SPEED 500 curved profiled sheets

Discover within two minutes how to install RIB-ROOF Speed 500 with curved profiled sheets and turned clips.
<http://install-speed500-curved.zambelli.de>

- 1. Place the first row of clips and click profiled sheet into place**
Align turned clips (fixing elements) along the verge, e.g. by means of a line. Set the first profiled sheet onto the turned clips and press it onto the profiled sheet seam. If you have installed them correctly, you can hear it click when pressing the profiled sheet into the clip.



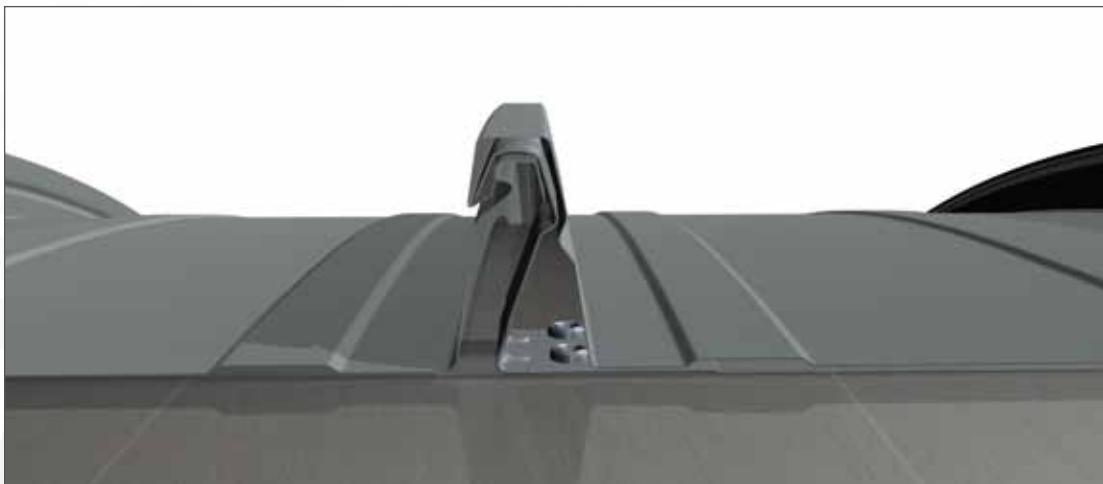
Curved profiled sheets are installed with turned clips.

- 2. Insert the next row of clips**
The next turned clips (fixing elements) will be set on the seam of the previously set profiled sheet and then fastened.



Through the profiled sheet seam turned clips have a firm hold.

- 3. Click-in the next profiled sheet**
Set the next profiled sheet again onto the turned clips and press on the profiled sheet seam. If you have installed them correctly, you can hear it click when pressing the profiled sheet into the clip.

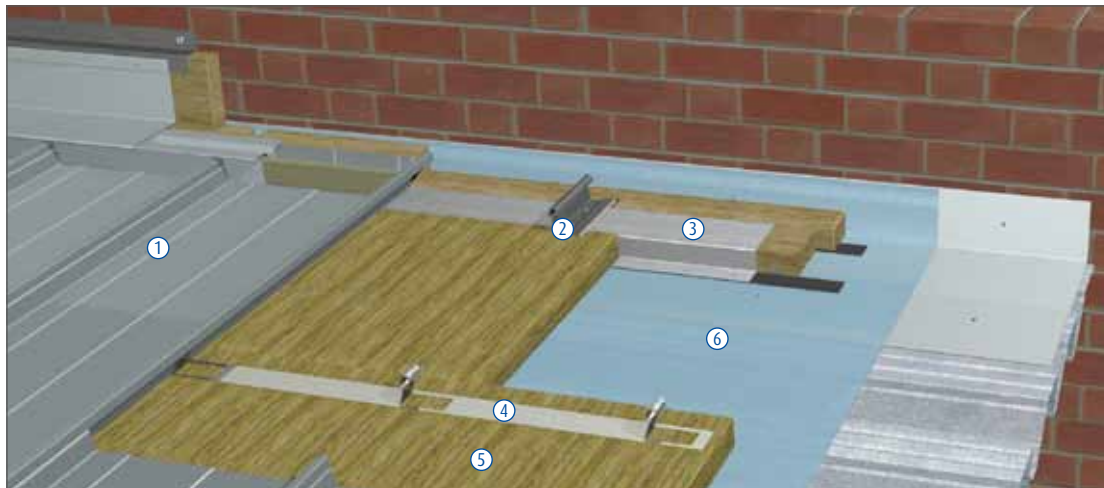


3.1.2 INSTALLATION ON FULLY-SUPPORTED INSULATION WITH CLIP BORDER



Film of installation principle RIB-ROOF SPEED 500 flat clip border on rigid insulation boards

Discover within two minutes how to install RIB-ROOF Speed 500 with clip border.
<http://install-speed500-clipborder.zambelli.de>



Trapezoidal profile parallel to eaves area*

RIB-ROOF Speed 500 can alternatively be installed on fully-bonded supports. Another alternative apart from wooden lathing is a pressure-resistant and rigid insulation board (application type WD). The installation of profiled sheets is carried out either on distance profiles, which correspond to the thickness of the thermal insulation, or on clip borders (perforated or flat), which are fixed directly on the supporting structure.

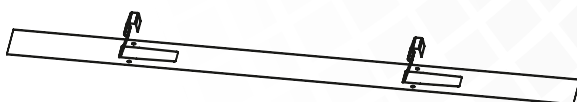
When installing thermal plates, open joints have to be avoided. This carrying out is also applicable with RIB-ROOF 465 when using the so-called pressure-distributing profiles.

- ① RIB-ROOF Speed 500
- ② Directional clip 1.0 x 200 mm as a fixed point
- ③ Hat profile
- ④ Flat clip border
- ⑤ Rigid insulation board
- ⑥ Vapour barrier membrane

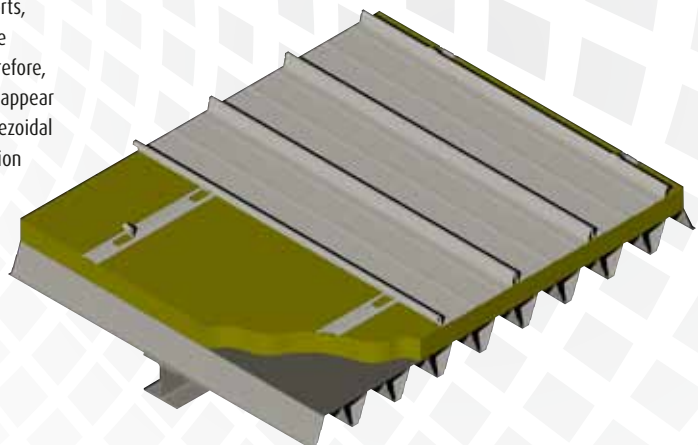
* A regular offsetting of the clip borders can be necessary due to statical reasons.

Field of application of the flat clip border RIB-ROOF Speed 500:

You can always use the flat clip border on fully-bonded supports, e.g. on wooden lathing or on rigid insulation boards, when the screws can be fastened close to the placed clip and later, therefore, on the seam of the profiled sheet so that the screw heads disappear in the cavity of the seam. It is also possible with defined trapezoidal profile measurements to use a flat clip border on rigid insulation boards when the trapezoidal profiles are installed on purlins from ridge to eaves (the top boom must be every 125, 250 or 500 mm).



Flat clip border, constr. length 3 m (drill hole \varnothing 7 mm)



Trapezoidal sheet ridge to eaves

INSTALLATION TECHNIQUE

RIB-ROOF SPEED 500

Field of application of the perforated clip border RIB-ROOF Speed 500:

You have to use perforated clip border on fully-supported rigid insulation boards if the clip border (also) has to be fastened between the clips and the screw heads have to vanish in the recess of the clip border. For an optimal laying, the rigid insulation board is routed at site with a mobile milling machine to a precise geometry of the perforated clip border. Should you intend to place an order, we are

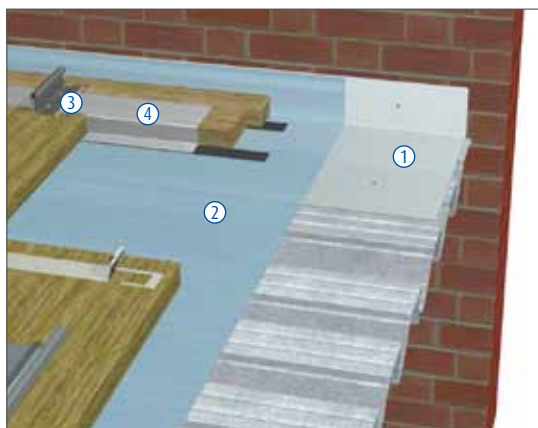
prepared to offer you a milling machine which is similar to a lawnmower. If blunt-pushed perforated clip borders, set side by side, are needed on a length of more than 30 m, clip borders are installed, as a result of length extension, after every 30 m either moved or you use a single clip in between.



Perforated clip border, constr. length 3 m
(drill hole on the clip Ø 7 mm, normally Ø 6 mm)

If you intend to use a perforated clip border, the thermal insulation should be milled out.

3.1.3 FIXED POINT OPTIONS



- ① Edge bracing
- ② Vapour barrier membrane
- ③ Directional clip 1.0 x 200 mm as fixed point
- ④ Hat profile



Roof pitches < 15°

With roof pitches < 15°, profiled sheet lengths of up to approx. 20 m and normal snow loads, the profiled sheets are installed at the ridge with fixing elements and are fastened with blind rivets at side (Ø 4.8 mm x 12 mm length).

Roof pitches > 15°

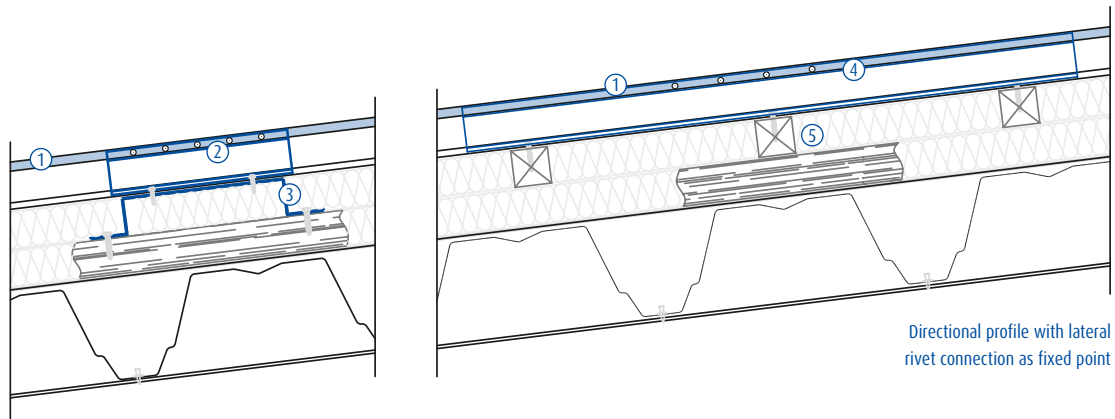
With roof pitches > 15°, high snow loads and sheet lengths of more than approx. 20m and a height of thermal insulation ≥ 160 mm, please contact us in advance so that we can plan the necessary amount of fixed-point rivet connection with special constructions, e.g. directional clip/profile or standard clip on hat profile.

The dilatation of profiled sheets from the fixed point to the ridge has to be considered when carrying out ridge caps. We are at your disposal for informing you about a sliding ridge option with directional profile and extended closure when intending to install long profiled sheets.

Tip: Loads of fixed points have to be diverted into the substructure.

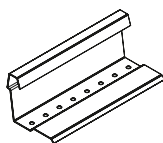
INSTALLATION TECHNIQUE

RIB-ROOF SPEED 500

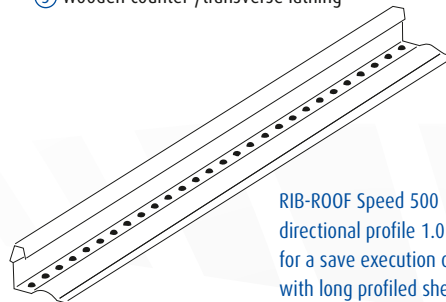


- ① RIB-ROOF Speed 500
- ② Directional clip 1.0 x 200 mm as fixed point riveted with profiled sheet
- ③ Hat profile

- ④ Directional clip 1.0 x 750 mm as fixed point riveted with profiled sheet
- ⑤ Wooden counter-/transverse lathing



RIB-ROOF Speed 500
directional clip 1.0 x 200 mm
as fixed point

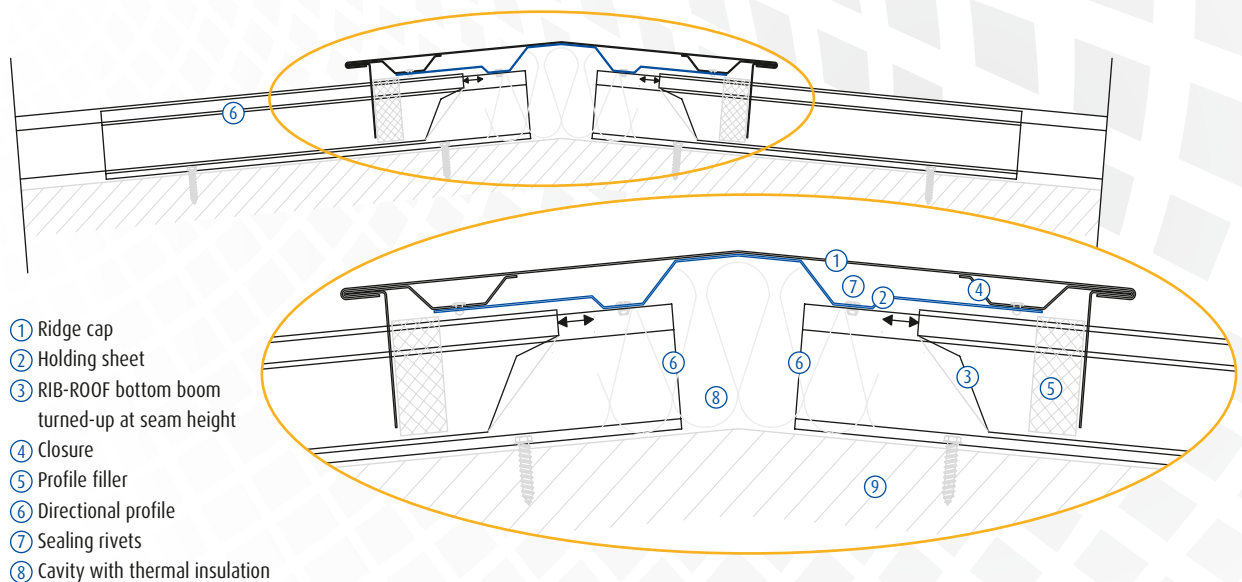


RIB-ROOF Speed 500
directional profile 1.0 x 750 mm
for a save execution of fixed points
with long profiled sheets

3.1.4 SLIDING RIDGE FOR ULTRA LONG PROFILED SHEETS

We recommend a "sliding ridge solution" with directional profile when intending to install ultra long profiled sheets. We can deliver the sliding ridge solution as package incl. the necessary directional profiles, closures and ridge caps.

Example: 100 m long profiled sheets made out of aluminium have a dilatation of approx. 40 mm in case the fixed point is installed at an approx. 1/3 of the length of the sheets. The material expansion has to be absorbed by the ridge cap. We are pleased to support you for your individual project.



- ① Ridge cap
- ② Holding sheet
- ③ RIB-ROOF bottom boom turned-up at seam height
- ④ Closure
- ⑤ Profile filler
- ⑥ Directional profile
- ⑦ Sealing rivets
- ⑧ Cavity with thermal insulation

INSTALLATION TECHNIQUE

RIB-ROOF 465

3.2 RIB-ROOF 465

INSTALLATION WITH SLIDING CLIPS

STRAIGHT PROFILED SHEETS WITH STANDARD CLIPS

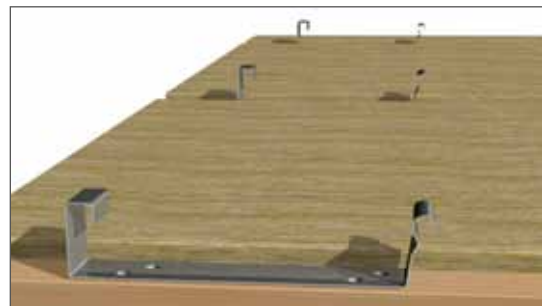


Film of installation principle RIB-ROOF 465

Discover within two minutes how to install RIB-ROOF 465 with straight profiled sheets and standard clips.
<http://install-465.zambelli.de>

1. Place the first row of clips

Align the clips (start or standard clips) along the verge and fasten them with rivets and screws approved by Construction Authorities (chapter 1.3.2). Further pre-assembling of sliding clips isn't necessary. The sliding clip distances depend on project specific data (span limits/ fixing element distances for enclosed halls, refer to chapter 2.8). Please generally pay attention to a higher wind load in edge and corner areas

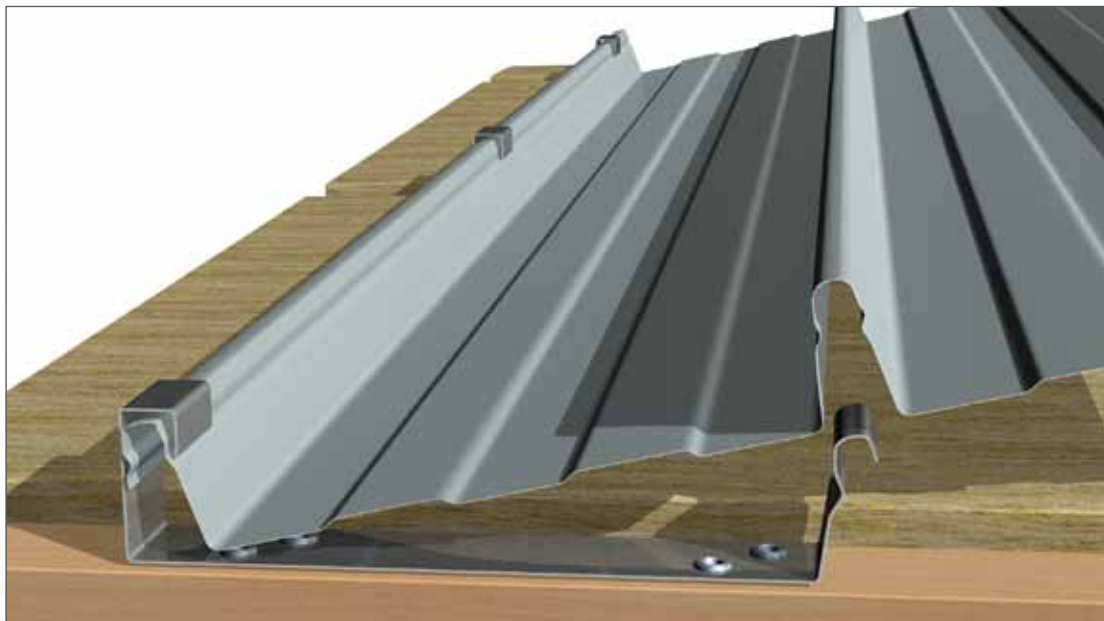


The first row of sliding clips with start clips is aligned along the verge side.

2. Insert the first profiled sheet

The first profiled sheet is swivelled with the large rib into the overlapping start clip and clicked onto the clip in the middle rib. Alternatively with standard clip, it is possible to press the large rib in the overlapping area together and click the profiled sheet with large

and middle rib onto the clip (click-into-place is hearable). Fasten the profiled sheet with brackets which spread to the outer rib on the substructure (this isn't necessary when using the start clip).



3. Place the next row of clips

The position of the next row depends on the construction width of the elements. We recommend to use a plumb line on the eaves as well as to regularly check the construction width in order to ensure a parallel and aligned installation of the profiled sheets. Now fasten the next row of clips at an angle of $> 90^\circ$ to the fastening structure to the rear edging of the bare small rib of the profiled sheet and swivel the profiled sheet onto the substructure. Click the clips into place in the longitudinal trough of the rib and fasten them onto the substructure.



The construction widths should be checked when laying profiled sheets. The standard clip is used up from the second row of clips.

Please fasten every profiled sheet with a fixed point clip or fixed-point profile in order to avoid a slide-off. With roof pitches $< 15^\circ$, sheet lengths of up to 20 m and normal snow loads, the small rib of every sheet is fastened with a blind rivet ($\varnothing 4.8 \text{ mm} \times 12 \text{ mm}$ length) in the ridge to the fixing element. The rivet head is going to be covered with the large rib of the next profiled sheet. Set the fixed point with sufficient distance to the ridge when installing longer profiled sheets in order to ensure a greater material expansion. Please also take into consideration the length expansion of the profiled sheet from fixed-point to ridge, also when using ridge caps, e.g. with enlarged closures.



Fixed-point clip

With roof pitches $> 15^\circ$, high snow loads and sheet lengths of more than approx. 20 m and height of thermal insulation $\geq 160 \text{ mm}$, please contact us in advance so that we can plan the necessary amount of fixed-points with special constructions, e.g. fixed-point clip/fixed-point profile or standard clips on hat profile.

4. Insert the next profiled sheet

Click the large and middle rib of the second profiled sheet onto the first one and onto the exposed part of the clip. Use the alternate merging principle and proceed from eaves point to ridge point. The clicking normally occurs by well-aimed walking (utilities: wooden

batten with drilled grooves). Thanks to moulded longitudinal troughs, the longitudinal pushes are rainproof after having been clicked into place. Zipping by machine or working concerning craftsmanship isn't necessary.

INSTALLATION TECHNIQUE

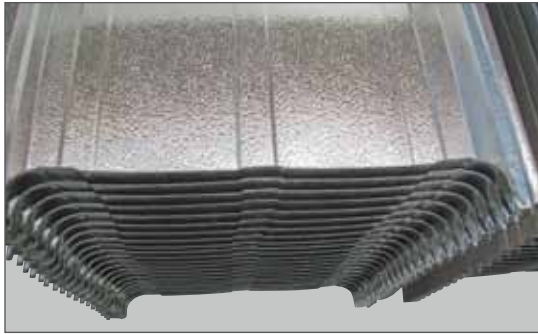
RIDGE

3.3 RIDGE

Folding up of profiled sheets at the ridge at factory

The water-distributing bottom booms of the profiled sheets have to be folded up in order to avoid eventual penetration of rain water or

drifting snow. The easiest way of folding the profiled sheet up at the ridge or down at the eaves is to order this service at our factory.



Folding up of profiled sheets at our factory, installation direction is from left to right

Folding up of profiled sheets at the ridge at site

Instead of folding up the profiled sheet at the ridge at our factory, it is also possible to do so at site by using our folding up tools.

The profiled sheets have to be folded up at the ridge before installing connections to other building components (e.g. walls, strip lights).

Otherwise, the folding up of the profiled sheets at the ridge will be carried out when installing. With RIB-ROOF 465 each large rib of the profiled sheet is going to be cut on its exposed seam end at an angle of 45° (have a look at right picture).



Folding up of profiled sheets with special tool

Ridge construction

Important: Before installing ridge caps or connecting sheets, the fixed-points of the profiled sheets have to be checked. The opposed material dilatation of the profiled sheet and ridge cap requires indirect fastening over the closures.

They will be aligned either on one side (single-pitch roof, wall or strip light connections) or on both sides (double pitch roof ridge) by a plumb line or a distance gauge and the ribs of profiled sheets are fastened with blind rivets or self-drilling screws.

INSTALLATION TECHNIQUE

TRANSVERSAL JOINT, NOTE

3.4 TRANSVERSAL JOINT

Profiled sheet transversal joints are generally **not necessary** since the length of the material dilatation is taken up by the fixing elements (clips). If the profiled sheets are **too long** (> 33 m) and, therefore, can not be transported with a truck, rollforming at site can be offered (refer to chapter 1.4.1).

However, if transversal joints are necessary, preferably welded profiled sheets out of aluminium are chosen. **In certain cases and exclusively with roof pitches of more than 7°**, transversal joints with sealing rivets and sealing material are executed. Contact us!

3.5 SEALING OF THE LONGIDUTIONAL JOINT

With **roof pitches of less than 1.5°** in subareas and differences in measurements or unevenness in the substructure (danger of forming puddle), an additional measure of sealing is recommended, the inserting of sealing tapes (e.g. brand ISO Chemie).

This solution is also recommended with curved roof constructions in the highest point running continuously up to reaching the angle of inclination of 1.5°.

3.6 IMPORTANT BASIC RULES FOR INSTALLATION

1. The installation has to be stopped with extreme weather conditions, single profiled sheets have to be fixed immediately. Installation can also be carried out with low outside temperatures since zipping isn't necessary with RIB-ROOF.
2. If you intend to walk on profiled sheets during installation, please refer to tables in chapter 2.5 and 3.4 (installation-related maximum support span of accessibility).
3. Before walking on the roof please point out to other craftsmen that they have to put down load-spreading elements in their walkway area, in order to avoid deformation or damage of profiled sheets. But be aware: before the customer has taken over the roof every damage may have to be paid by the company which has installed the profiled sheets provided that there isn't another person responsible.
4. The connection of the profiled sheets to above-ground building components requires folding up of bottom boom before installation (available at our factory), have a look at chapter 3.3.

3.7 INSPECTION AND MAINTENANCE

If you want more information about a maintenance contract or roof and façade controls, please visit the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) at www.wasserwaermeluft.de or the IFBS ("Industrieverband für

Bausysteme im Metalleichtbau"), which is an important industrial association that represents companies operating in the field of construction systems in light metal, at www.ifbs.de.

CONSTRUCTION DETAILS

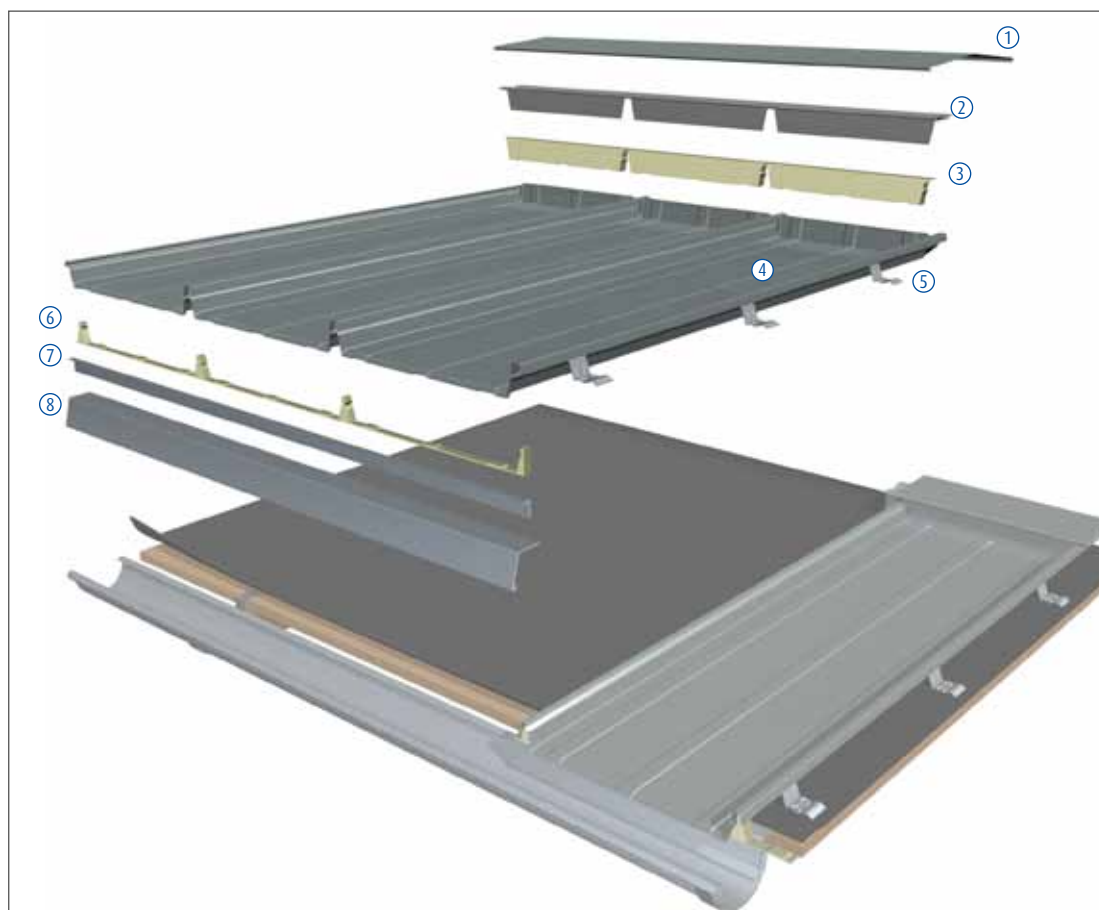
OVERVIEW

The development of details of ridges, verges and eaves always has to be homogeneous in the interest of architecture (eventually installation of samples in accordance with the client). In the following you will get some suggestions as an example for construction details.

The standard CAD detail drawings in all common file formats can be downloaded from our website www.zambelli.com – or simply ask for our CD.



RIB-ROOF Speed 500



- ① Ridge cap
- ② Closure
- ③ Profile filler - top side

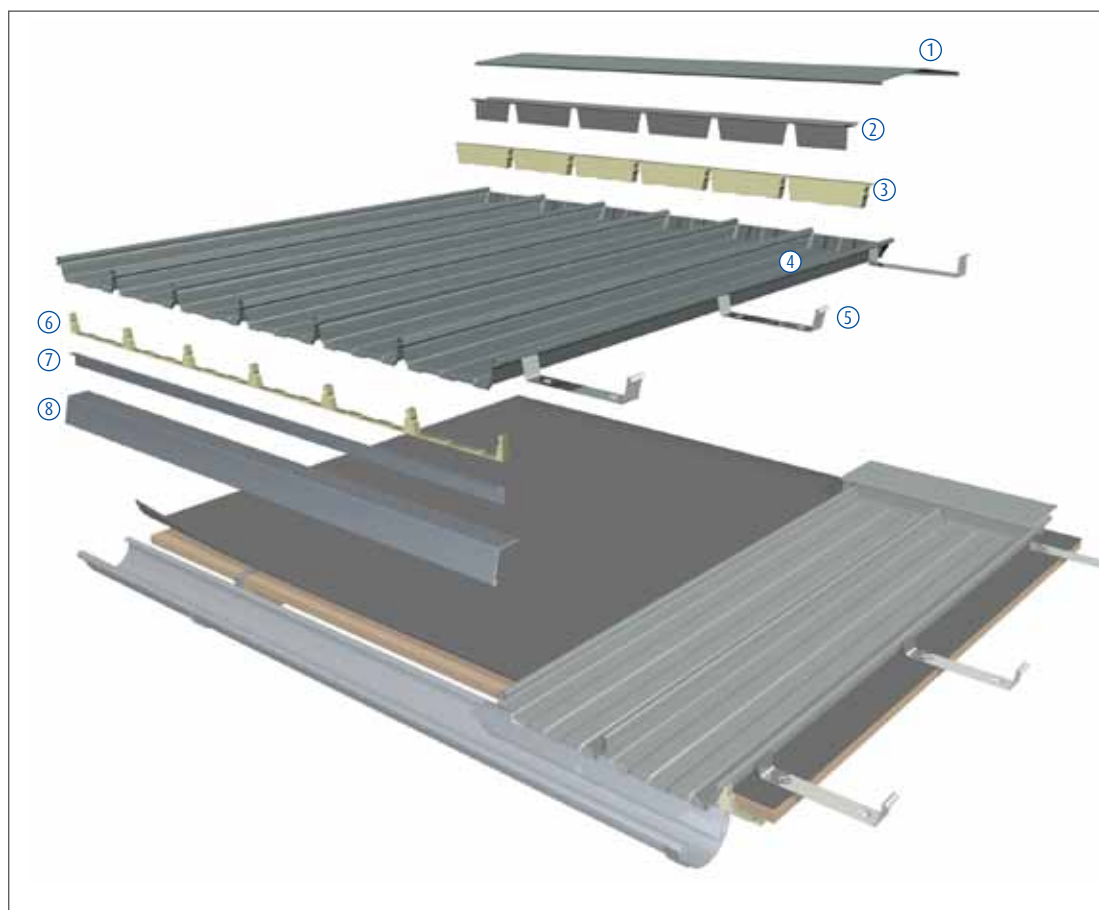
- ④ RIB-ROOF Speed 500
- ⑤ Standard clip Speed 500
- ⑥ Profile filler - rear side

- ⑦ Eaves angle
- ⑧ Gutter inlet sheet

CONSTRUCTION DETAILS

OVERVIEW

RIB-ROOF 465



- ① Ridge cap
- ② Closure
- ③ Profile filler - top side

- ④ RIB-ROOF 465
- ⑤ Standard clip 465
- ⑥ Profile filler - rear side

- ⑦ Eaves angle
- ⑧ Gutter inlet sheet

CONSTRUCTION DETAILS

RIDGE

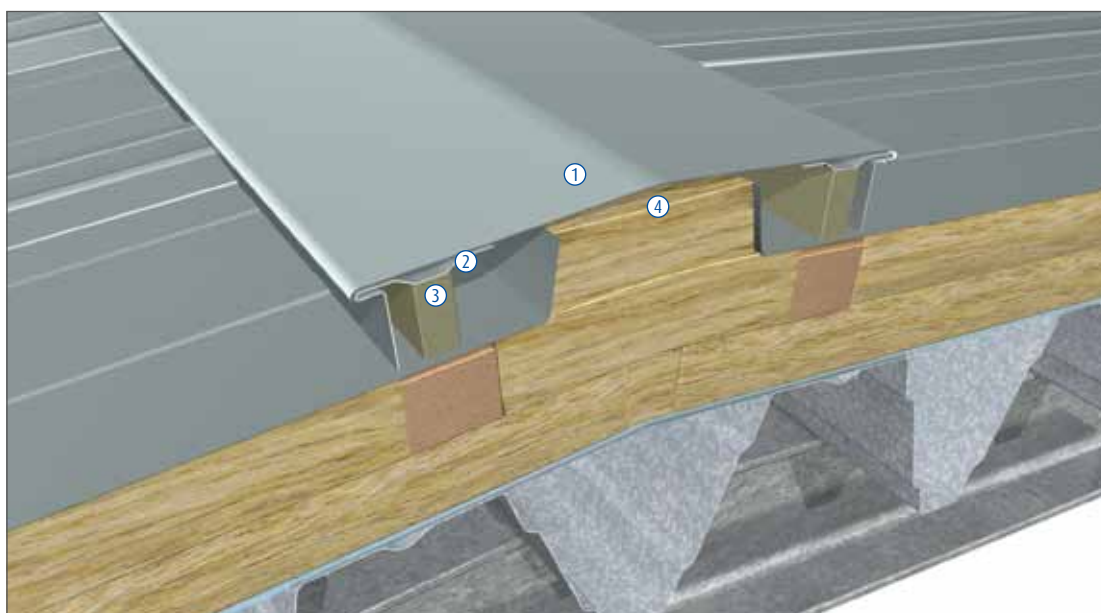
4.1 RIDGE

4.1.1 DOUBLE PITCH RIDGE

The double pitch ridge **without any openings for ventilation** (for single-skinned roof constructions, warm roof) is hung on the closures with its backward-bending on both sides (crimping with approx. 10 mm radius) and pressed together on its seam. The connection

is folded by craftsmen or is carried out with blind rivets on the extension gadgets.

If required fillers will be installed. The structure and distance of extension gadgets have to be observed in any case.



- ① Double pitch ridge cap
- ② Closure

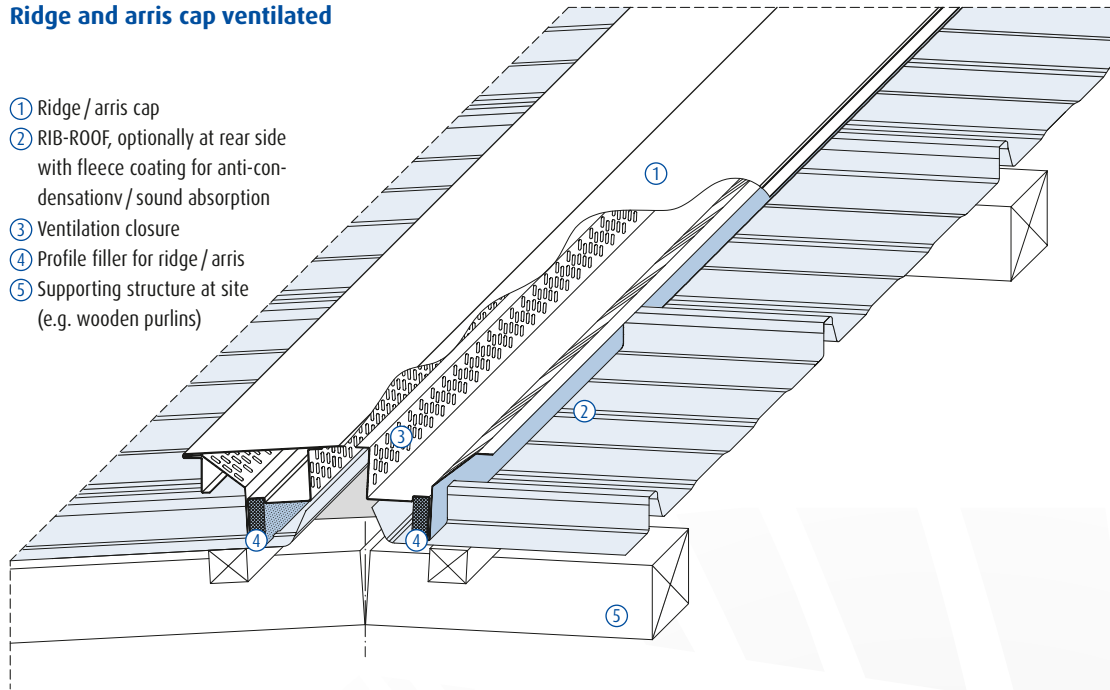
- ③ Profile filler - top side
- ④ Thermal insulation

The double pitch ridge **with an opening for ventilation** (for double-skinned roof constructions, cold roof) is a standard product of our delivery program and available in all materials according to our roof-

ing materials as a construction kit with two integrated ventilation closures and profile fillers.

Ridge and arris cap ventilated

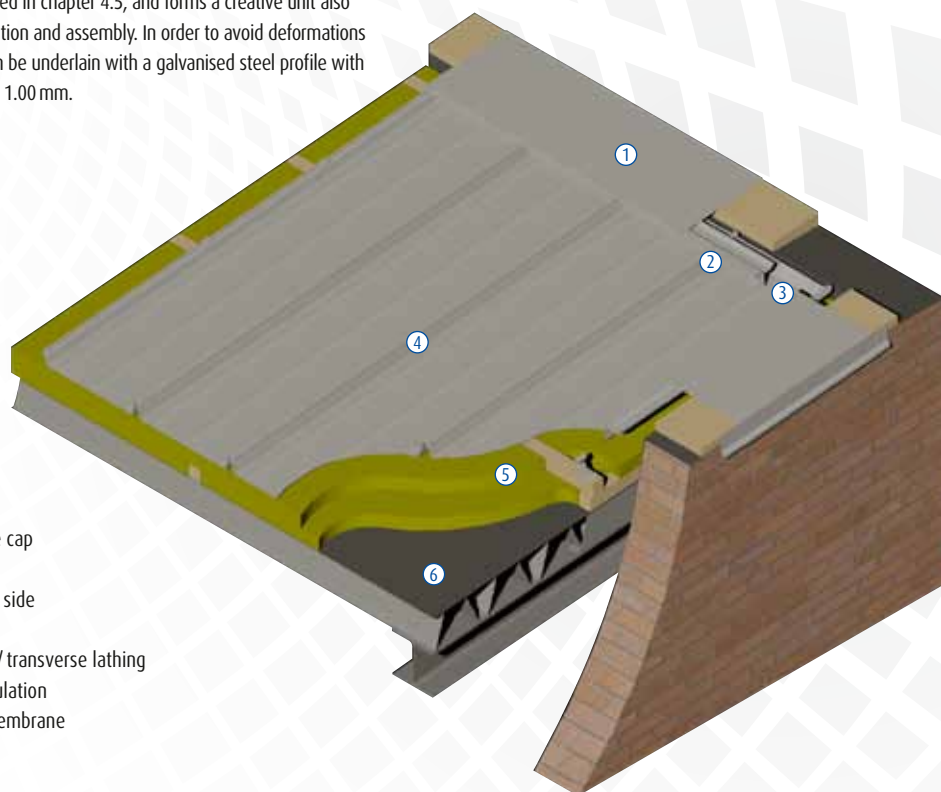
- ① Ridge / arris cap
- ② RIB-ROOF, optionally at rear side with fleece coating for anti-condensation / sound absorption
- ③ Ventilation closure
- ④ Profile filler for ridge / arris
- ⑤ Supporting structure at site (e.g. wooden purlins)



4.1.2 SINGLE PITCH RIDGE

The single pitch ridge (without / with openings for ventilation) is similar to the verge, mentioned in chapter 4.5, and forms a creative unit also with regard to installation and assembly. In order to avoid deformations of the ridge cap, it can be underlain with a galvanised steel profile with a thickness of at least 1.00 mm.

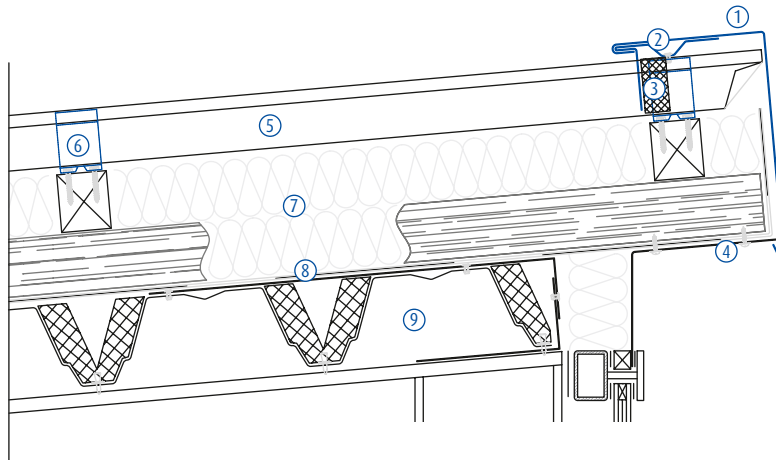
- ① Single pitch ridge cap
- ② Closure
- ③ Profile filler - top side
- ④ RIB-ROOF
- ⑤ Wooden counter / transverse lathing with thermal insulation
- ⑥ Vapour barrier membrane



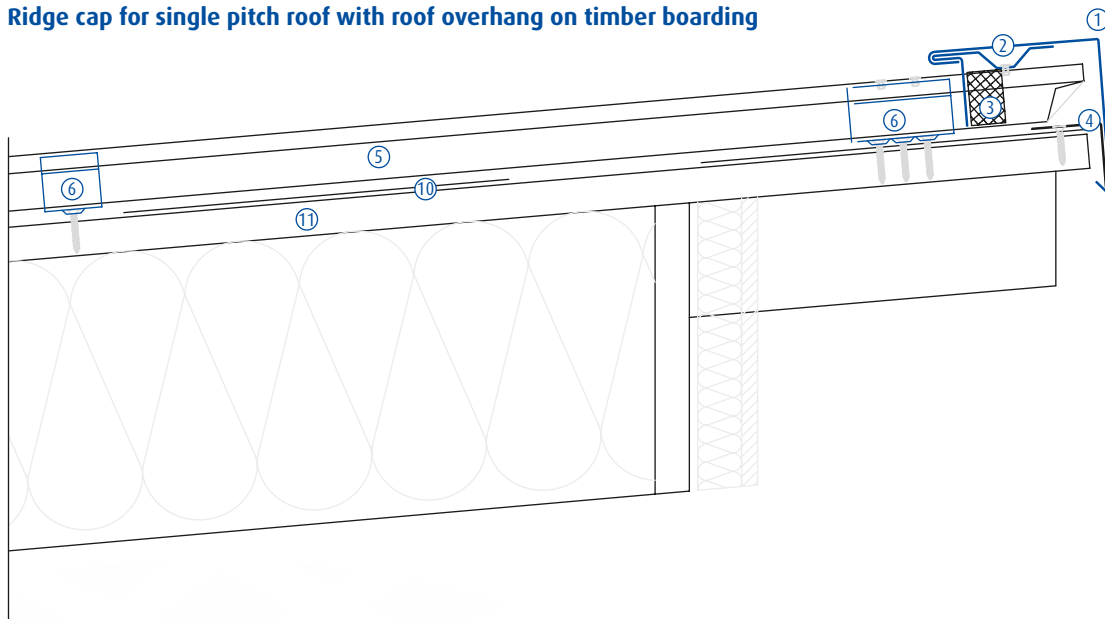
CONSTRUCTION DETAILS

RIDGE

Ridge cap for single pitch roof with roof overhang on trapezoidal sheet



Ridge cap for single pitch roof with roof overhang on timber boarding



- ① Single pitch ridge cap
- ② Closure
- ③ Profile filler - top side
- ④ Stopping plate

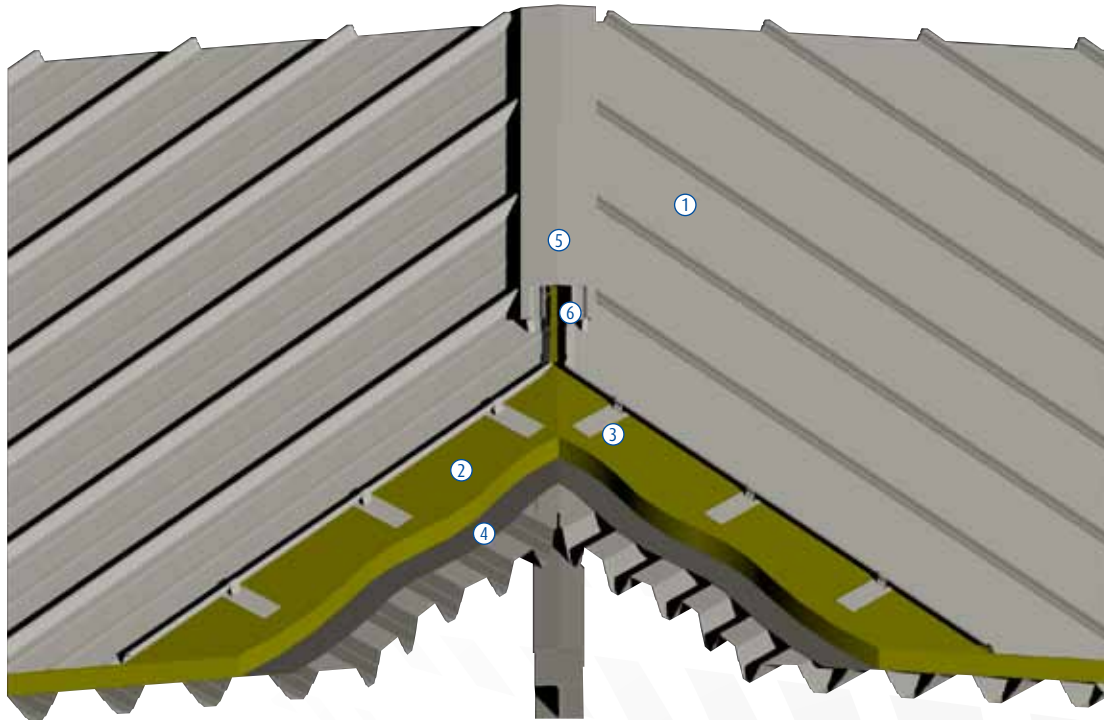
- ⑤ RIB-ROOF
- ⑥ Standard clip / directional clip
- ⑦ Wooden counter / transverse lathing with thermal insulation

- ⑧ Vapour barrier membrane
- ⑨ Trapezoidal sheet with bracing on edge
- ⑩ High diffusion-open protective sheet
- ⑪ Timber boarding minimum $t = 24 \text{ mm}$

4.2 ARRIS

Arris are finished in a similar way as a double pitch ridge. The closures aren't equipped at our factory with notches for profiled sheet ribs (► high seams). These will be marked at site and cut with plate

shears in order to reach an optimal fitting. The construction details of ridge caps can be used in the general sense.



- ① RIB-ROOF
- ② Rigid insulation boards

- ③ Clip border
- ④ Vapour barrier membrane

- ⑤ Cover sheet for aris
- ⑥ Suspended profile for aris

Analogous to a ventilation ridge cap, there can also be used a ventilated cover sheet for aris utilizing a ventilation closure (delivery without notches).

CONSTRUCTION DETAILS

EAVES

4.3 EAVES

There is a multiplicity of gutter varieties which are used in different countries and regions. They shouldn't be described here in detail.

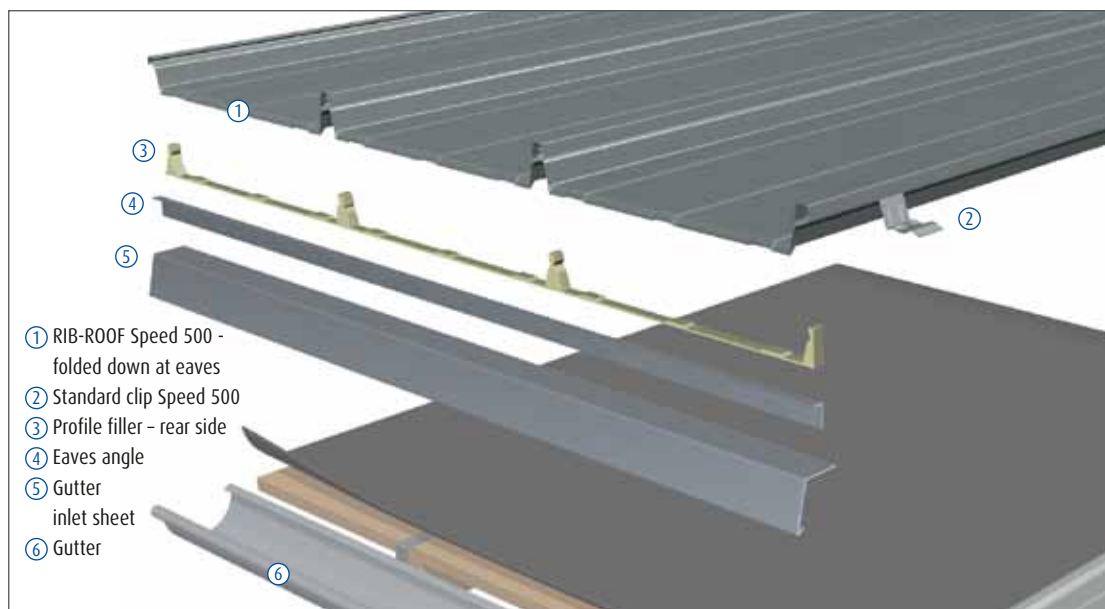
The external hung gutter is the easiest verge design. The classical gutter in semicircular or box-like shape is fastened with gutter brackets on the eaves plank. We assume that you know about the installation technique according to DIN 18339 - plumbing works. For

ventilated roof constructions, a formation of air inlets (at least 4 cm airflow cross section) below eaves is given. Additional profile filler can be fastened at rear side duo to optical reasons.

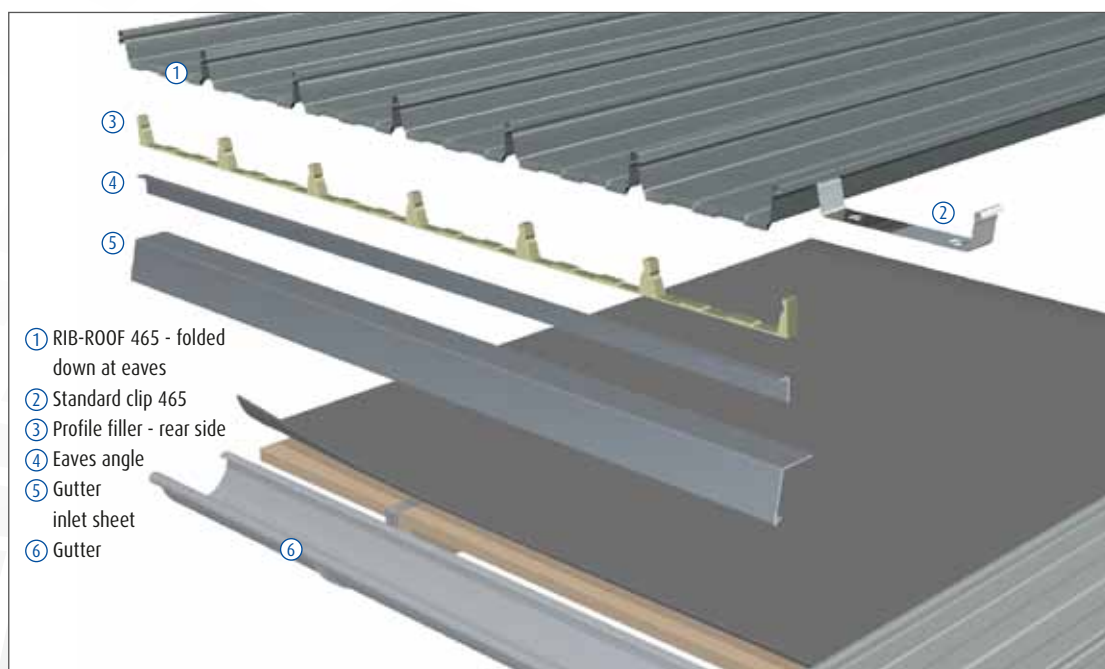
The eaves sheet (► gutter inlet sheet) forms the connection of the roof to the gutter and should be made with a cutting of 333 mm.

The profiled sheets have to be folded down at the eaves – upon request, this can already be done at our factory

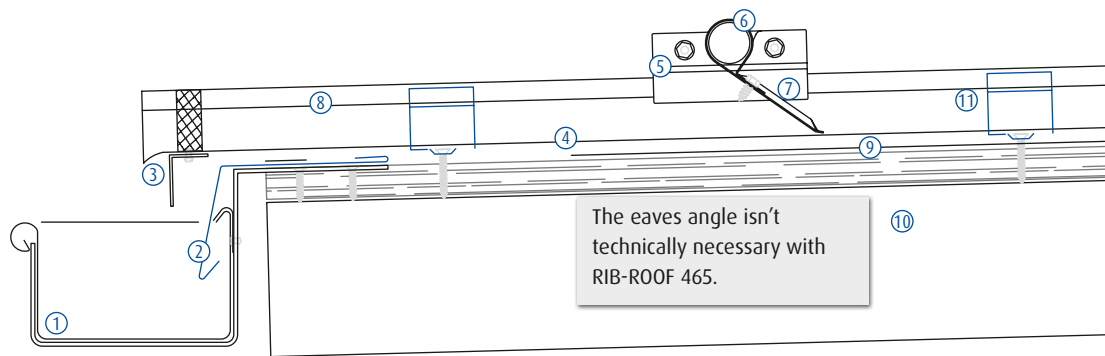
RIB-ROOF Speed 500



RIB-ROOF 465

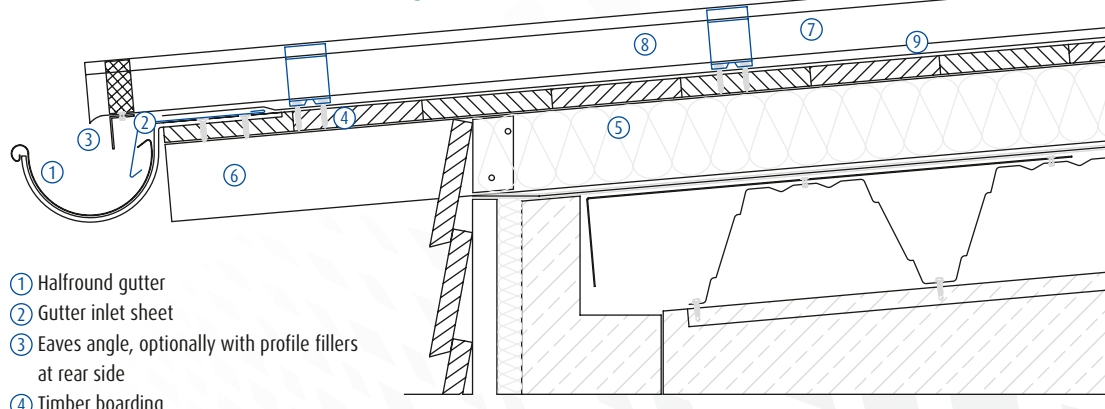


Detail box gutter with snow guard and ice stopping system



- | | | |
|---|--|------------------------------------|
| ① Box gutter | ④ High diffusion-open protective sheet | ⑧ RIB-ROOF - folded down at eaves |
| ② Gutter inlet sheet | ⑤ Snow guard bracket | ⑨ Timber boarding |
| ③ Eaves angle, optionally with profile fillers at rear side | ⑥ Snow guard pipe Ø 32 mm | ⑩ Rafter |
| | ⑦ Ice stopper | ⑪ Standard clip / directional clip |

Eaves construction with roof overhang



- | |
|---|
| ① Halfround gutter |
| ② Gutter inlet sheet |
| ③ Eaves angle, optionally with profile fillers at rear side |
| ④ Timber boarding |
| ⑤ Thermal insulation |
| ⑥ Eaves rafter |
| ⑦ RIB-ROOF - folded down at eaves |
| ⑧ Standard clip / directional clip |
| ⑨ High diffusion-open protective sheet |

The high diffusion-open protective sheet or other separation layers cover the eaves sheet in order to divert eventually arising secondary water which accumulates itself in the gutter. The gutter overhang of the profiled sheets depends on the drawings in chapter 4.3 (at least 30 mm). After installing the profiled sheets, water-loaded bottom booms have to be feather-edged with tools for folding up and down profiled sheets to the gutter.

Alternatively, a roof overhang with an overhanging directional profile can be realized with RIB-ROOF Speed 500.

Securing of eaves against wind load with RIB-ROOF 465

Eaves formations with sloped steps are used as a creative element in architecture or with extreme long profiled sheets. The detailed construction single ridge roof applies, in the general sense, to the rising wall.

The securing of eaves against higher wind load on eaves is carried out when there is an overlapping seam with rivets.

► Please refer to chapter 4.4 "Sloped steps".

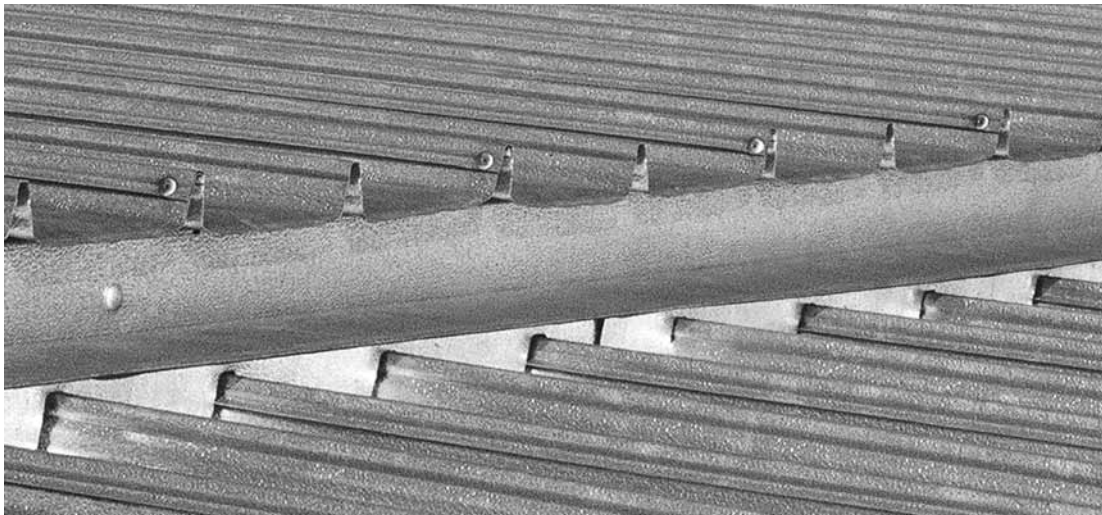
CONSTRUCTION DETAILS

SLOPED STEPS / VERGE

4.4 SLOPED STEPS

Sloped steps are used as a creative element of architecture or with extremely long profiled sheets. In the general sense, the details of a single pitch ridge to a rising wall are applied. The sloped step has to

be protected against penetrating pelting rain by means of installing an eaves strip.



4.5 VERGE

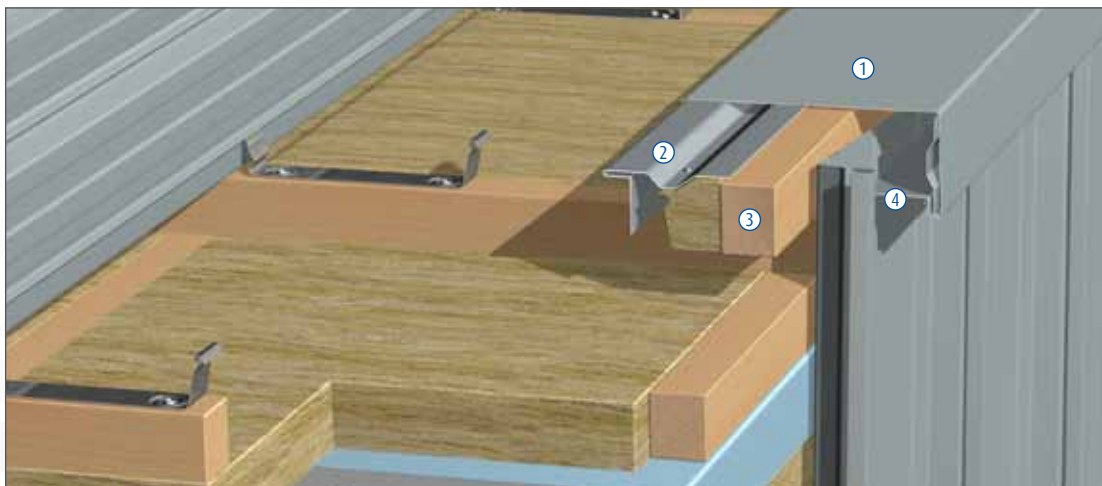
The profiled sheet at the edge ends in one of the three possibilities

■ With a **large rib** (► top chord): the profiled sheet is covered by a cover sheet for verge which is fastened with blind rivets (distance approx. 50 cm) on the top chord. The connection has to take place at a distance of approx. 75 mm to sliding clips in order to enable the dilatation of the profiled sheet.

Important: The distance of the encroaching cover sheet up to the top chord has to be sized sufficiently so that the penetration of rain by means of capillary sized can be avoided.

■ With a **small rib** (► top chord): the edge profiled sheet is fastened with an end clip on the substructure, further installation has to be carried out as before-mentioned.

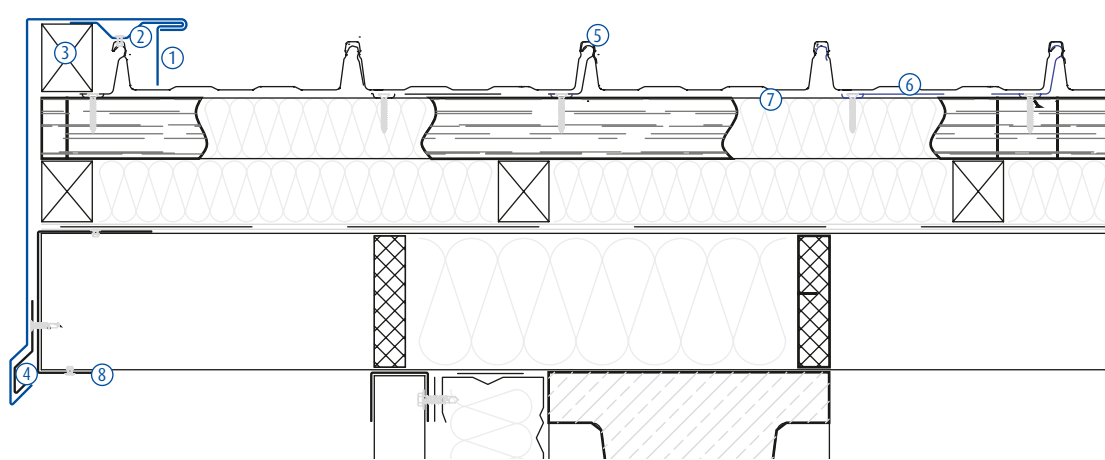
■ **Installation by craftsmanship:** the bottom boom of the edge profiled sheet is bended at the edge at an angle of 90° to a water seam. Afterwards, the verge sheets are folded onto the edge profiled sheet.



- ① Cover sheet for verge
- ② Suspended profile

- ③ Verge plank
- ④ Stopping plate / closure

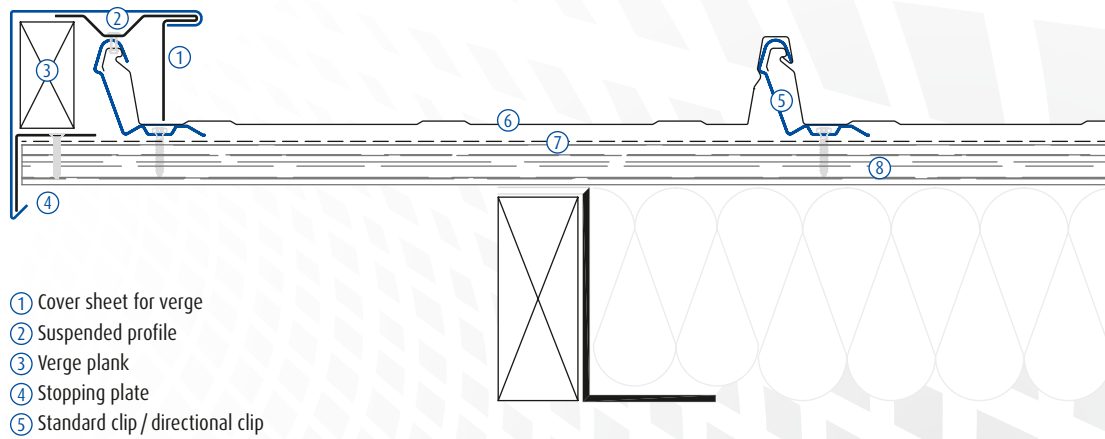
Cover sheet for verge with roof overhang on trapezoidal sheet



- ① Cover sheet for verge
- ② Suspended profile
- ③ Verge plank
- ④ Stopping plate
- ⑤ Standard clip / directional clip
- ⑥ RIB-ROOF
- ⑦ High diffusion-open protective sheet
- ⑧ Trapezoidal sheet with edge profile

The installation of a verge plank as a support and a stopping plate on the façade is recommended in all structures in order to avoid material expansions which may lead to corrugation and unpleasant deformations of the cover sheets for verge. The connection of the cover sheet for verge is folded by craftsmanship or installed with stopping plates.

Cover sheet for verge with roof overhang on timber boarding



- ① Cover sheet for verge
- ② Suspended profile
- ③ Verge plank
- ④ Stopping plate
- ⑤ Standard clip / directional clip
- ⑥ RIB-ROOF
- ⑦ High diffusion-open protective sheet
- ⑧ Timber boarding minimum 24 mm

The installation of a verge plank as a support and a stopping plate on the façade is recommended in all structures in order to avoid material expansions which may lead to corrugation and unpleasant

deformations of the cover sheets for verge. The connection of the cover sheet for verge is folded by craftsmanship or installed with stopping plates.

CONSTRUCTION DETAILS

WALL CONNECTION

4.6 WALL CONNECTION AT RIDGE/AT SIDE

Wall connection with attica cover sheet at ridge

An overhang strip, which is supplied with sealing tape or permanently elastic joint material and then pressed together by screw connection, has to be cut into the wall when connecting brickwork and rendered facades. The overhang strip has to be processed before plastering.

A closure is used when a single pitch ridge is connected to a rising wall. The wall connection at side on a brickwork takes place by means

of utilizing a suspended profile (for verge). The details for verges apply here in the general sense.

You can complete the wall connection with an appropriate structural **attica cover sheet at ridge**. The overhang strip isn't needed in this case.

Wall connection at ridge



- ① Sealing joint
- ② Overhang strip (rendered strip)
- ③ Wall connection
- ④ Closure
- ⑤ RIB-ROOF

CONSTRUCTION DETAILS

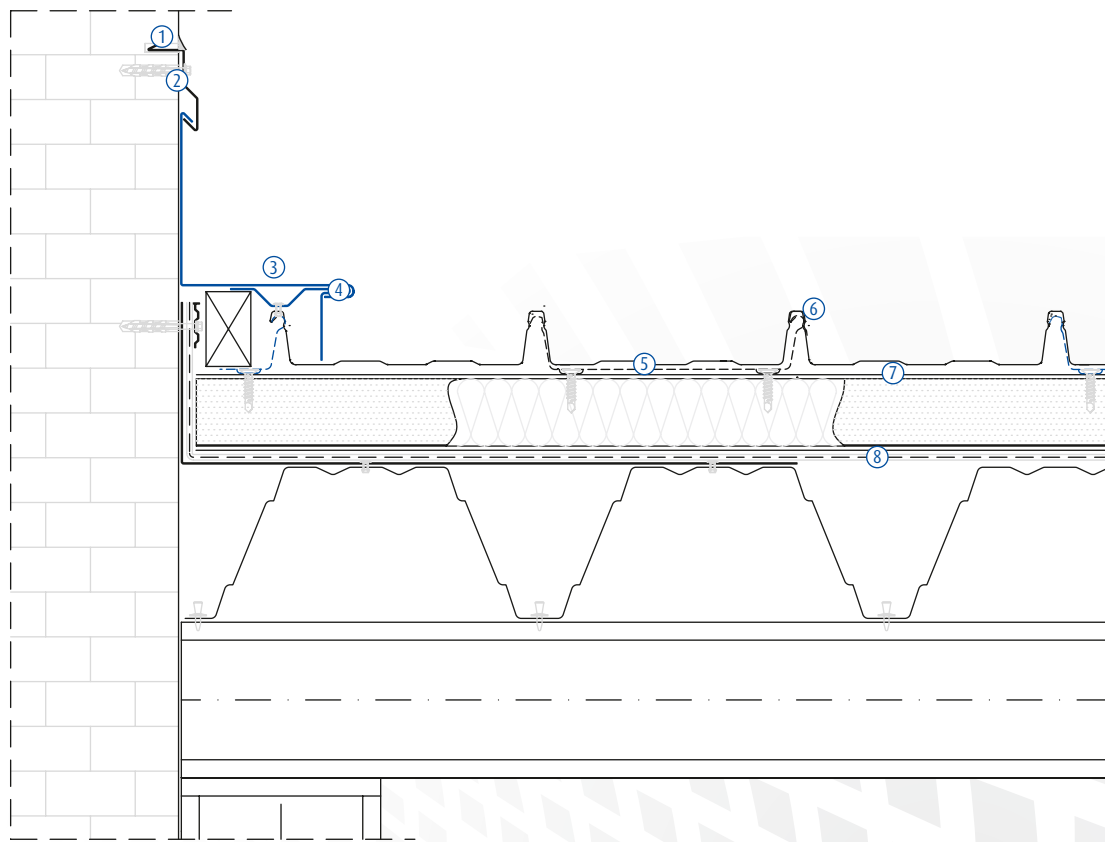
WALL CONNECTION

The wall connection at side is installed on metal, brickwork and other façade constructions either parallel or tapered to the profiled sheets.

The construction details for verges apply here in the general sense. The overhang strip (rendered strip), as mentioned in section 4.1.2 (single pitch ridge on a rising wall), is to be used when exposed concrete, brickwork or plastered walls have to be connected to it. With **roof pitches of less than 25°**, the connection height of 15 cm shouldn't be below them.

The connection on an attica at side requires a detailed connection in two parts. Therefore, the connection to the profiled sheets has to be carried out as mentioned above. The flashing of a tapered sheet has to be folded into the bending at edge of the connection at side by craftsmanship.

Wall connection at side on brickwork or plastered façade



- ① Sealing joint
- ② Overhang strip (rendered strip)
- ③ Wall connection at side
- ④ Suspended profile
- ⑤ RIB-ROOF
- ⑥ Standard clip / directional clip
- ⑦ High diffusion-open protective sheet (optional)
- ⑧ Vapour barrier membrane

CONSTRUCTION DETAILS

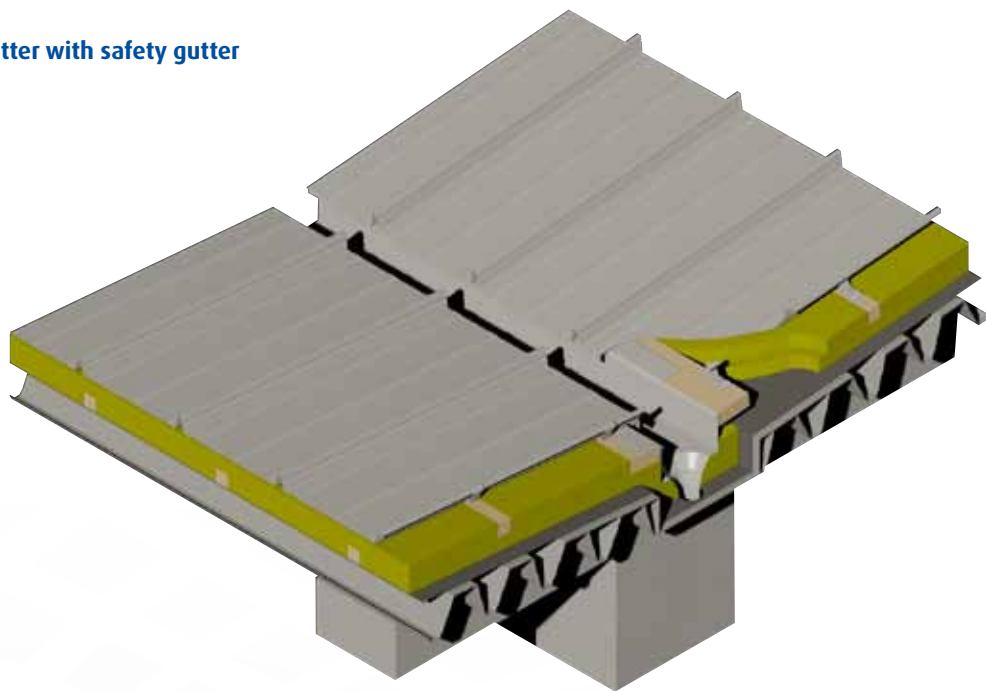
INTERNAL GUTTER

4.7 INTERNAL GUTTER

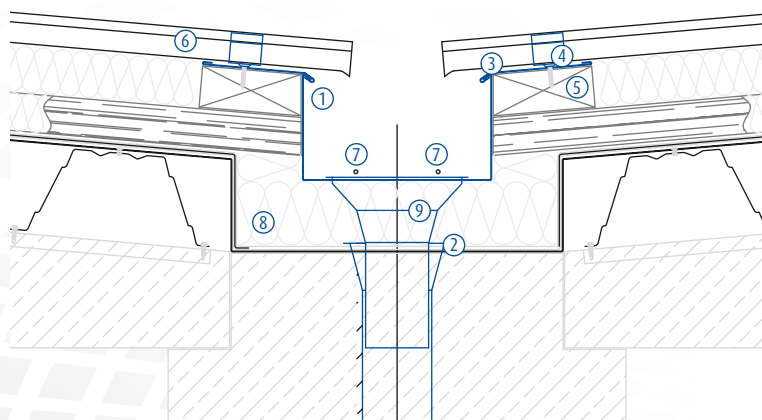
Internal gutters are special constructions. Therefore, we recommend to absolutely follow the following safety measures:

- The **sizing** of the gutter and downpipe (where applicable emergency overflow) has to be carried out according to DIN 18460 or DIN 1986-100 and enables a professional installation and cleaning. The amount of outlets (at least 2) has to be doubled from the arithmetical result.
- The **length expansions** have to be guaranteed with an appropriate amount of extension elements.
- The **outlets** have to be made funnel-shaped and connected to the supporting and water-loaded gutters. According to DIN 1986-100, the run-off capacity has to be reduced arithmetically by 50% when using gutter sieves.
- The installation of the gutter has to be adapted in connection with **thermal-insulated roof constructions** (use rigid insulation boards).
- The minimum distance between supporting and water-loaded gutter should be at least 20 mm.
- A **gutter slope** of at least 5 mm/n should be guaranteed.
- The gutter has to be **kept clear from snow** by installing a snow guard system and thermostatically controlled gutter heating.
- Conclude a **maintenance agreement** with the client.
- Moreover, the standards for plumbing works have to be adhered, published by the Central Association for Sanitary, Heating and Air Conditioning, St. Augustin.

Internal gutter with safety gutter

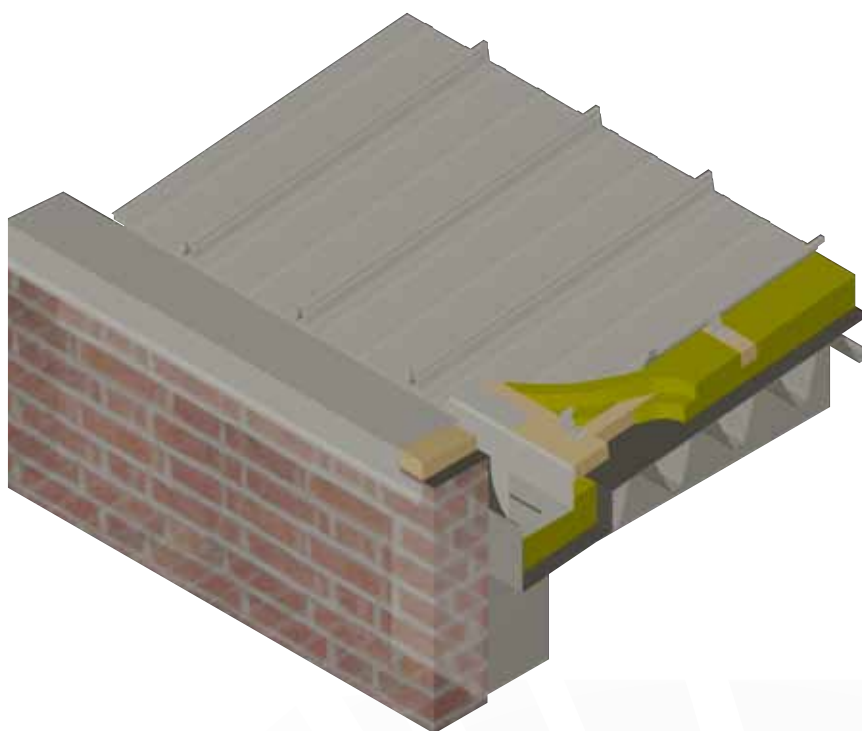


- ① Water-loaded gutter
- ② Safety gutter
- ③ Gutter inlet sheet
- ④ Standard clip / directional clip
- ⑤ Wooden plank
- ⑥ RIB-ROOF
- ⑦ Gutter heating (optional)
- ⑧ Rigid insulation board
- ⑨ Outlet in two parts, welded with tapered inlet

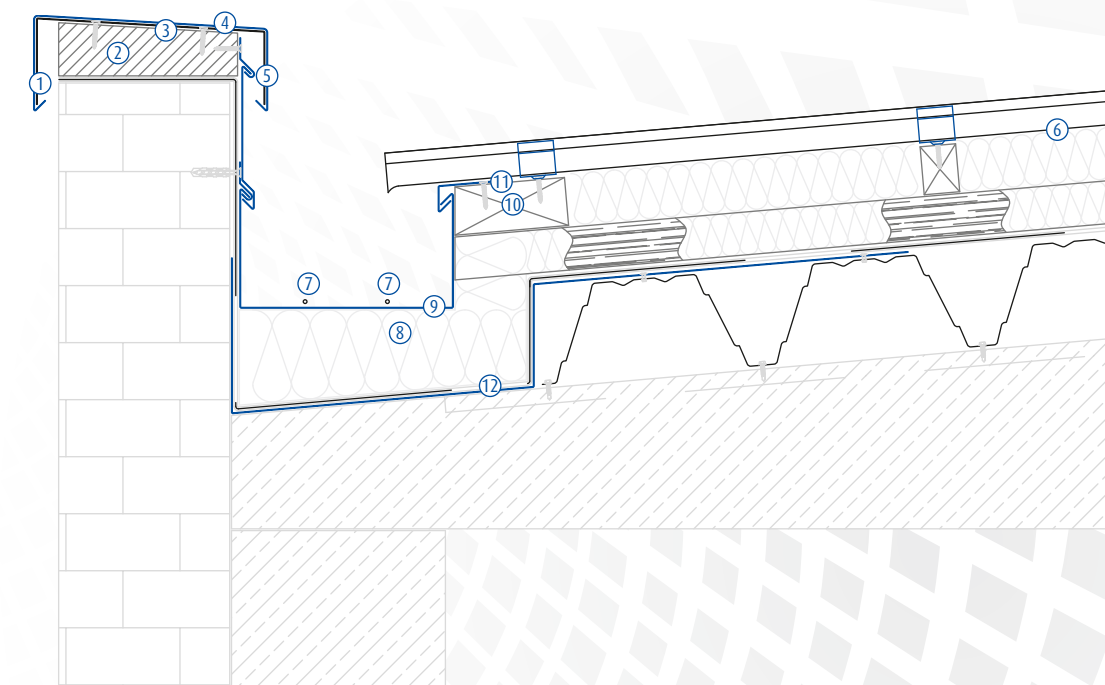


CONSTRUCTION DETAILS

INTERNAL GUTTER



Attica with wall connection and attica gutter



- ① Stopping plate
- ② Wooden attica plank
- ③ Separation layer
- ④ Attica cover sheet
- ⑤ Attica connection sheet
- ⑥ High diffusion-open membrane (optional)
- ⑦ Gutter heating (optional)

- ⑧ Rigid insulation board
- ⑨ Water-loaded gutter
- ⑩ Wooden plank
- ⑪ Standard clip / directional clip
- ⑫ Load-bearing safety gutter

CONSTRUCTION DETAILS

VALLEYS

4.8 VALLEYS

The detail of valleys depends on length and slope. Latter is, as a rule, lower than the connecting roof pitch. The valleys should be made reinforced with roof constructions with a **pitch of $< 7^\circ$** .

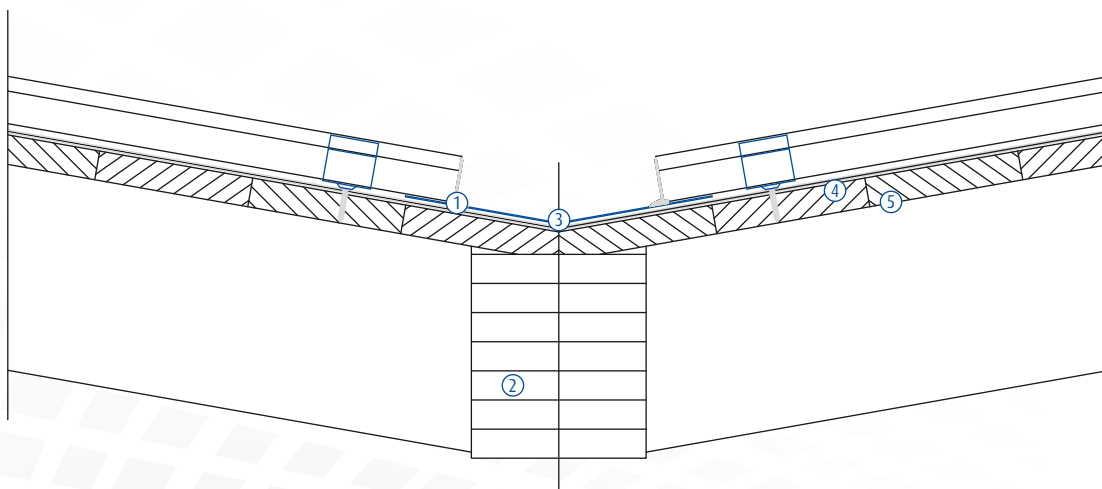
This installation detail already has to be considered when planning. The basic rules of an internal gutter apply here in the general sense.



Since the valleys have to absorb length expansions of the inletting profiled sheets, the connections have to be installed according to above-shown image or images in chapter 4.7 respectively.

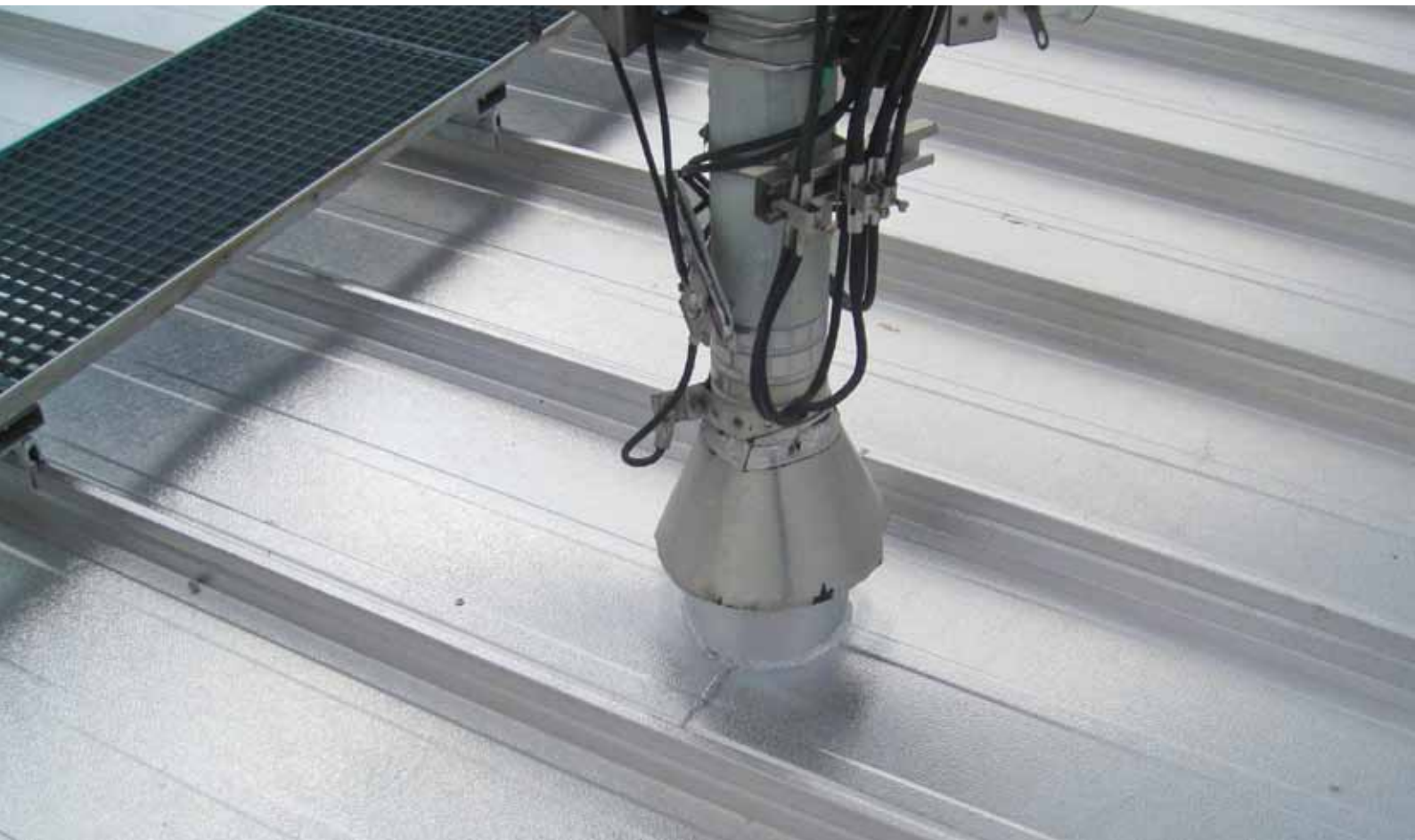
The connections are made by means of double cross fold and sealing layer or by soldering (titanium zinc and copper) or welding (aluminium) with roof **pitches of less than 7°** . A double cross fold is sufficient with **pitches of more than 7°** .

Welded valley gutter



CONSTRUCTION DETAILS

ROOF PENETRATIONS



4.9 ROOF PENETRATIONS

Roof penetrations and their enclosures are made, according to their material, either by craftsmanship or are welded/soldered water-proof. They require utmost care and professional expertise in plumbing technique.

According to the leaflet “**Bonding in plumbing technique**”, published by the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) in 53757 St. Augustin, Germany, the bonding of metals is also a possible alternative plumbing technique. Single-component polyurethane adhesives are usually used when plumbing.

The water diversion and dilatation in length of profiled sheets in the area of penetration have to be guaranteed by suitable measures. The height of enclosures depends on the roof pitch, as a rule, 15 cm aren't undercut.



4.9.1 ROUND ROOF PENETRATIONS

Round roof penetrations are sealed with pre-assembled, tapered outlets into the roof (sealing rivets and silicone sealant, soft and hard soldering, welding, bonding). The upper sealing is carried out by means of a cuff which is taller than the lower outlet.

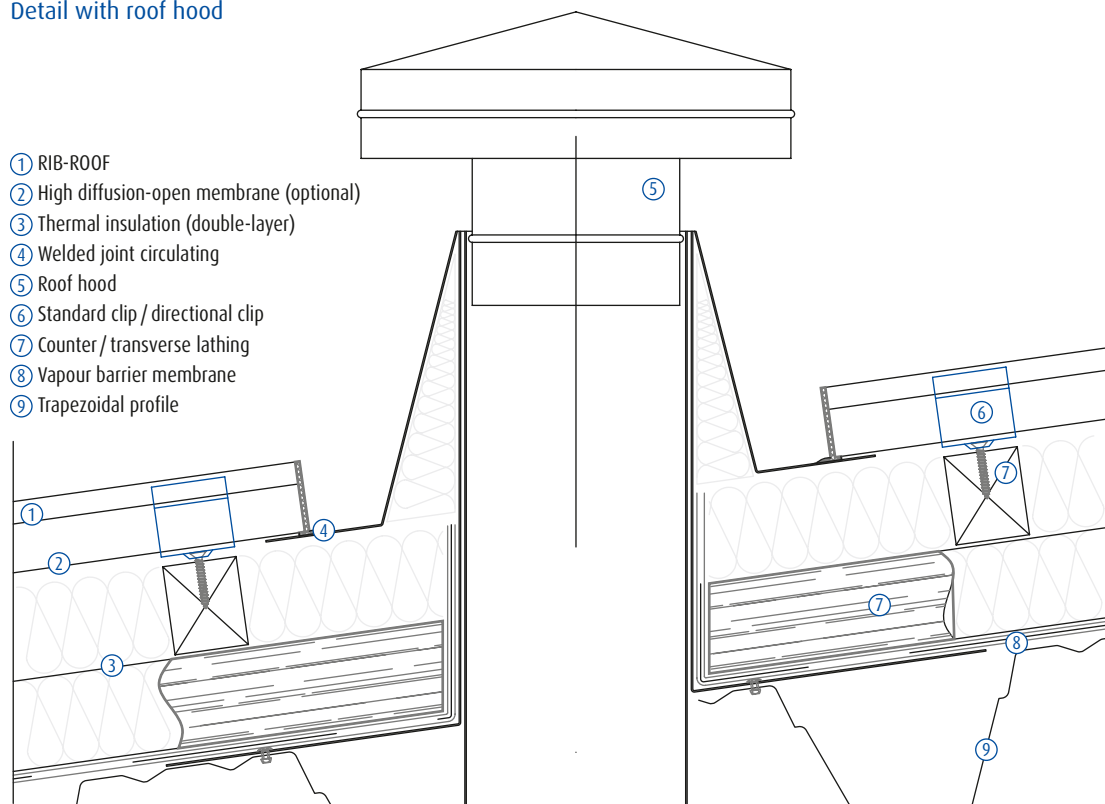
The substructure has to be protected temporarily with **appropriate materials against fire** (wood) and **damage** (protective membrane) when soldering or welding.

CONSTRUCTION DETAILS

ROOF PENETRATIONS

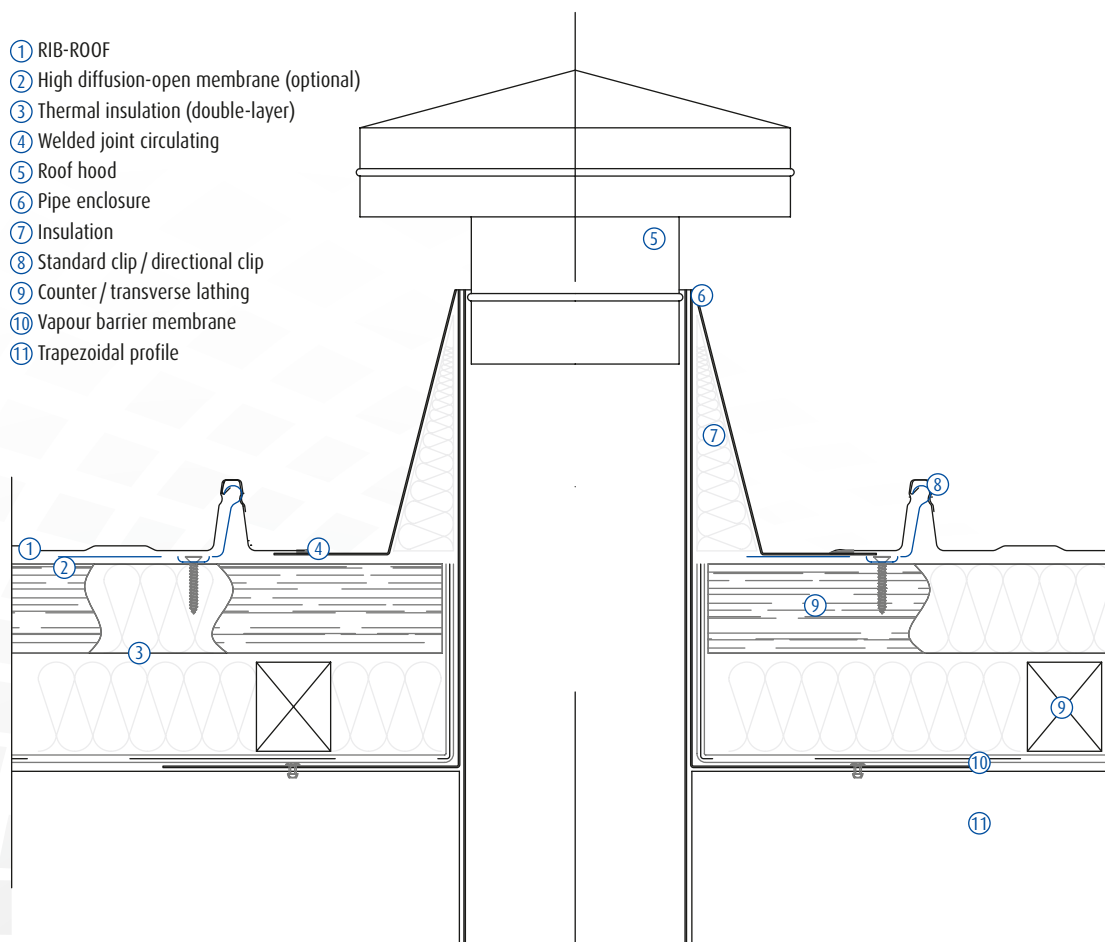
Welded room vent pipe

Detail with roof hood



Welded room vent pipe

Detail with roof hood



CONSTRUCTION DETAILS

ROOF PENETRATIONS



4.9.2 SOAKER FOR DOME LIGHT

Smoke and thermal outlet construction

Welding of soaker:

The ribs of the profiled sheets are separated in the area of penetration at ridge and eaves on the highest point in the middle to a length of approx. 30 cm, both seams are overlapped and the created seam as well as the openings of the ribs are welded or soldered corresponding to the materials.

The requirements of the load transfer of section 4.9 apply here in the general sense. A fastening of the soakers can only be carried out if the fixed points of the profiled sheets are also located in their area.

The material expansion is obstructed from welded as well as sealed and riveted soakers. This should be considered when planning the fixed point locations. Recommendable is e.g. the location of all fixed points in the area of the soakers instead of the position close to the ridge.

CONSTRUCTION DETAILS

ROOF PENETRATIONS



The following measures described have to be fulfilled with **larger measurements** and abdication of water-proof welding/soldering or soaker for sealing:

- Lifting up of water supply in back of penetration up to the ribs of the profiled sheets by means of installation of a double standing seam roofing on corresponding substructures (e.g. wooden lathing with separation layer).
- Lifting up of water supply over the ribs of profiled sheets by means of installation into a higher distance construction (e.g. wooden counter lathing) in back of penetration and setting of lifted RIB-ROOF profiled sheets below the ridge cap.
- The created openings at the side have to be covered with tapered cut sheets by craftsmanship (image on next page).

4.9.3 RECTANGULAR ROOF PENETRATIONS

Rectangular roof penetrations (chimney-roof windows-dome light) are covered by craftsmanship with an end sheet at rear side (▶ valley board / ▶ neck moulding-carrying out with central higher placed bending for channelling water on both sides), a sheet

on left and right hand side as well as a lower cover sheet (▶ front edge board) and are integrated into the roof. The height of the frames has to be a minimum of 15 cm above the profiled sheet area all the way around.

With **roof pitches of more than 15°**, an easy covering of the back sheet through the profiled sheets is sufficient.

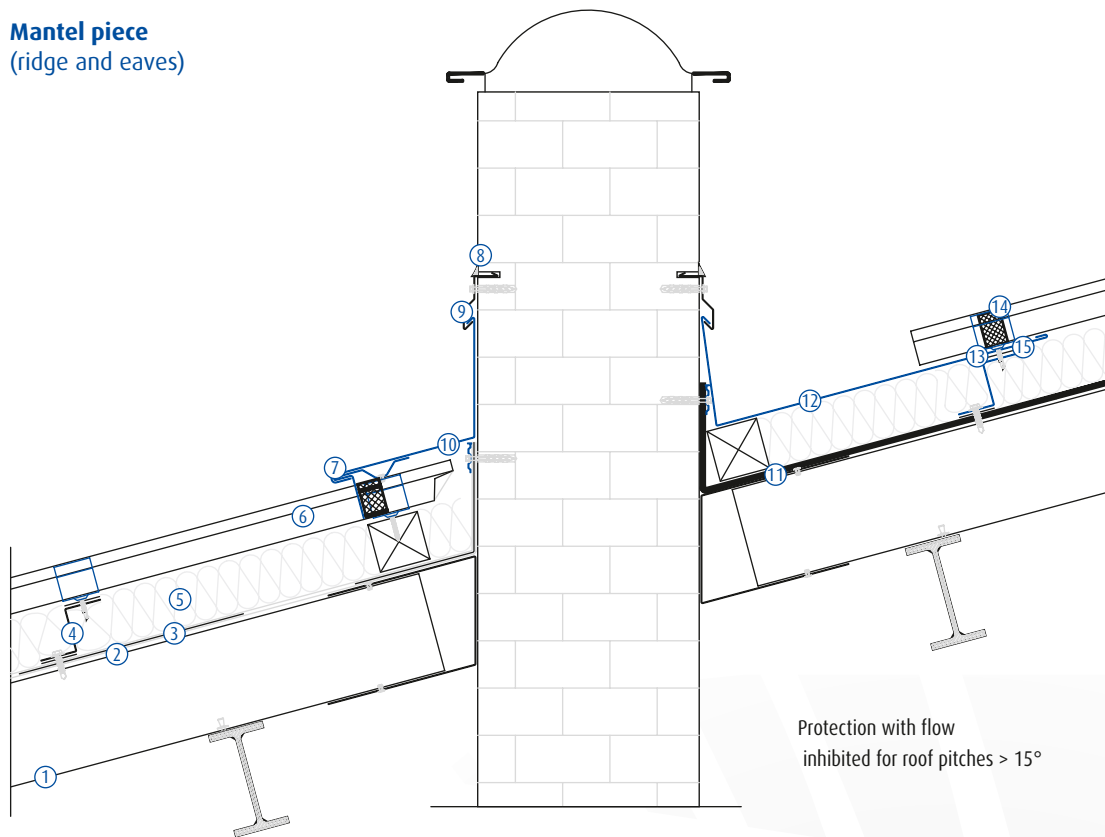
With **roof pitches of less than 15°**, the measures, described in chapter 4.9.2, have to be adhered to.



CONSTRUCTION DETAILS

ROOF PENETRATIONS

Mantel piece (ridge and eaves)



- ① Trapezoidal profiles
- ② Vapour barrier membrane
- ③ Thermal separation layer
- ④ Z-profile (diagonally)
- ⑤ Thermal insulation (single-layer)
- ⑥ RIB-ROOF
- ⑦ Closure
- ⑧ Sealing joint

- ⑨ Overhang strip
- ⑩ Overhang sheet at ridge
- ⑪ Overhang at edge
- ⑫ Overhang at rear
- ⑬ Bonding strip
- ⑭ Standard clip / directional clip
- ⑮ Sealing tape

CONSTRUCTION DETAILS

ROOF PENETRATIONS

4.9.4 DOME LIGHT

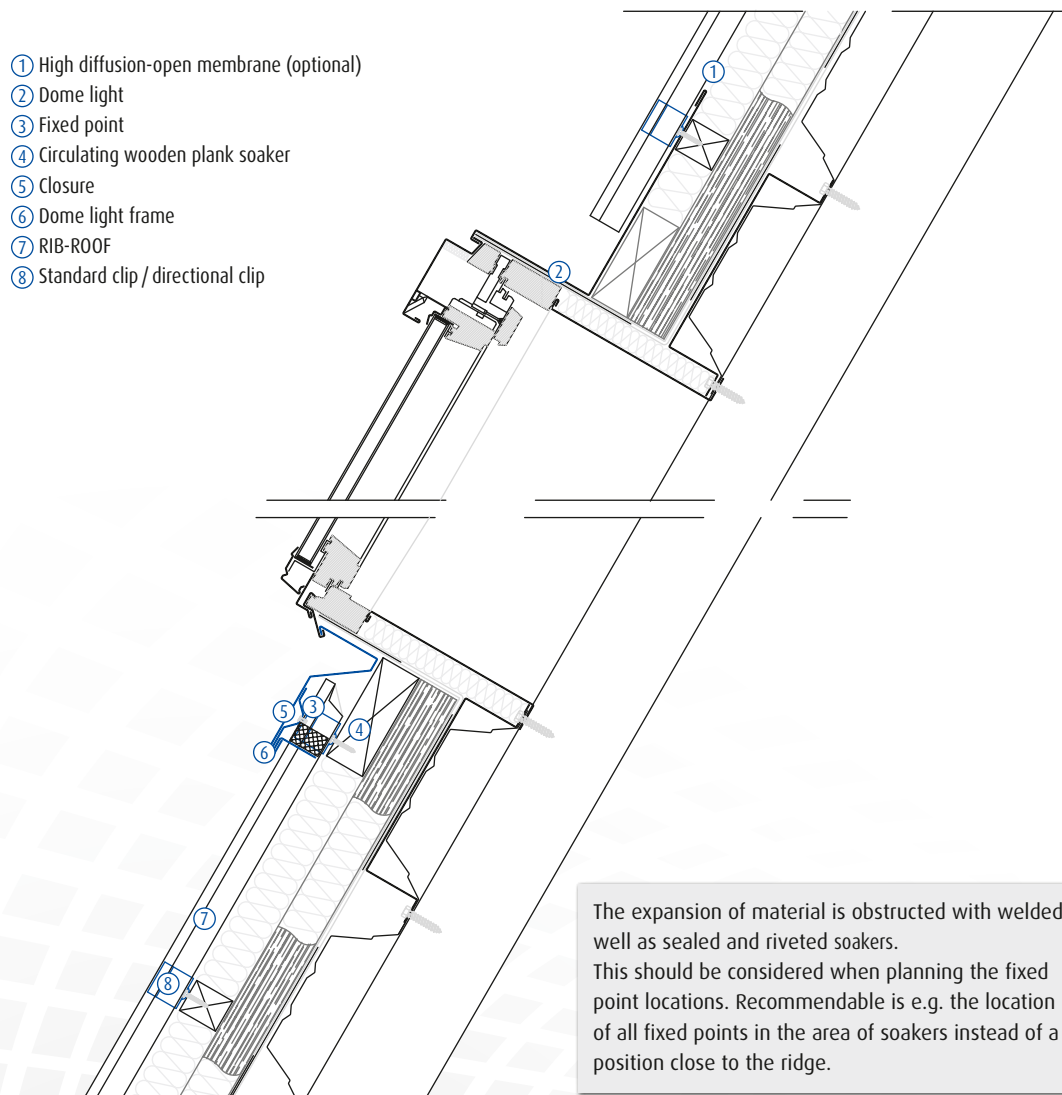
For **roof pitches of more than 15°**, a sealing frame is sufficient. The soaker is integrated with circulating RIB-ROOF elements into the roof.

A profiled sheet overlapped on rear side has to be made according to section 3.4/transversal joint.



The profiled sheets which are directed to the eaves have to be folded up in the bottom boom and fastened with fixed points in order to avoid slipping. This area is covered with a pre-assembled front edge board of the soaker. The sealing of the profiled sheet transversal joints has to be effected as before mentioned.

In an **area of roof pitches of more than 1.5°**, welding or soldering of soaker is necessary with suitable materials. The profiled sheets are laid onto the flange of the soaker in course of roofing and the circulating joints are densely welded or soldered, respectively. The reverse profiled ribs which are directed to eaves are sealed with the same technique.



CONSTRUCTION DETAILS

PHOTOVOLTAIC



4.10 PHOTOVOLTAIC ON RIB-ROOF

The following details have to be considered when planning and installing:

■ Snow drifts and formation of ice:

Before planning it has to be guaranteed that there will not arise snow drifts in bulk and large formation of ice between the PV modules due to a partially shaded and/or transversal frame in extreme winter conditions. With raised PV modules this can especially lead to flow inhibition or can reduce the effectiveness of the modules.

■ Freezing melting water:

In winter times it could be possible at snow-covered roofs that in sunlit areas defrosting takes place. The resulting melting water is collected on its way towards eaves in the shaded areas of snow accumulation between the raised PV-modules. When the temperature later goes down, especially at night, the melting water freezes together with the snow accumulation which then results

in ice formation what, in turn, implicates further intensification of flow inhibition, especially with changing melting and frost periods.

■ Prefer roofs with thermal insulation:

Sufficiently insulated roofs and dome lights/light tapes without any larger thermal bridges and without non-insulated roof overhangs are preferred, so that the above-mentioned problems can be avoided during winter.

■ General recommendation:

A roof with highly diffusion-open protective sheets is the best solution with raised systems for snowy regions. A realization of eaves with an at least 3 m wide, highly diffusion-open protective sheet is here the minimum solution.

Please also refer to the IFBS quality leaflet "Solar technique in light metal trade". Advice for planning and structure, August 2012

CONSTRUCTION DETAILS

PHOTOVOLTAIC

There are three options when building new buildings, renovating roofs and refitting roofs with RIB-ROOF metal roofing systems in regard to with photovoltaic systems. You are free to decide the ar-

chitectural guidelines and project-related calculations of profitability. You can decide what's the best solution for your project. We are pleased to inform you about this in detail!

1. PV-modules parallel to the roof

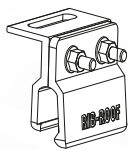


Installation parallel to the roof

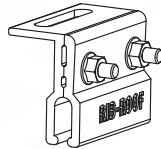
Additional roof load approx. 15 – 35 kg/m²; all common PV-modules and substructure systems can be used

The substructure for an installation of PV-modules parallel to the roof is installed with RIB-ROOF solar brackets perforation-free onto RIB-ROOF profiled sheets.

Solar bracket Speed 500



Solar bracket 465



Solar brackets are also applicable as brackets for lightning protection according to DIN EN 50164-1, test category N.

A design load of $F_Z = 0.5 \text{ kN}$ on the load case wind loads can be taken for one RIB-ROOF solar bracket.

Solar brackets mustn't be installed directly in the area of fixing elements, so that an length expansion of the profiled sheets is guaranteed. Tightening torque for screws 20 Nm.

CONSTRUCTION DETAILS

PHOTOVOLTAIC

2. Raised PV-modules



Raised installation

Additional roof load approx. 15 – 35 kg/m²; all common PV-modules and substructure systems can be used

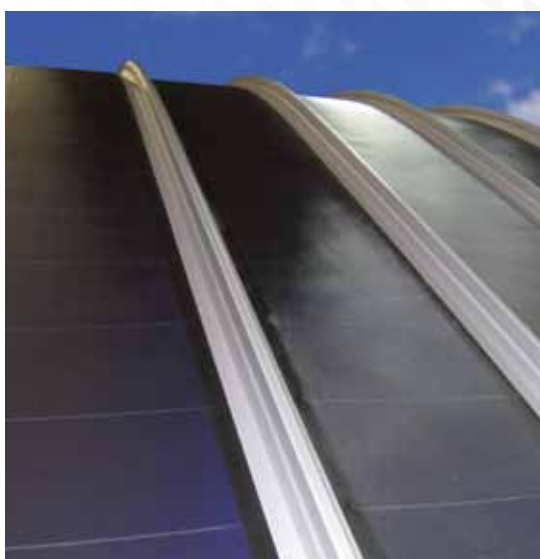
The substructure for an installation of raised PV-modules is installed with RIB-ROOF solar brackets penetration-free onto RIB-ROOF profiled sheets.

The orientating of the PV-modules can be optimized above the substructure on the pre-assembled installation angles of our RIB-ROOF solar brackets according to their direction and roof pitch.

Note:

In order to avoid formation of ice in snowy regions, special measures have to be taken.

3. PV-modules with solar laminate which are integrated into the building, bonded directly onto RIB-ROOF Speed 500



Additional roof load up to 5 kg/m²; Biosol PV laminate, capacity 144 Wp

In this case, the foil laminate, consisting of thin-layer cells with the most modern triple-junction technology, are directly bonded onto the coated RIB-ROOF Speed 500 profiled sheets, without any profiling of the bottom boom.

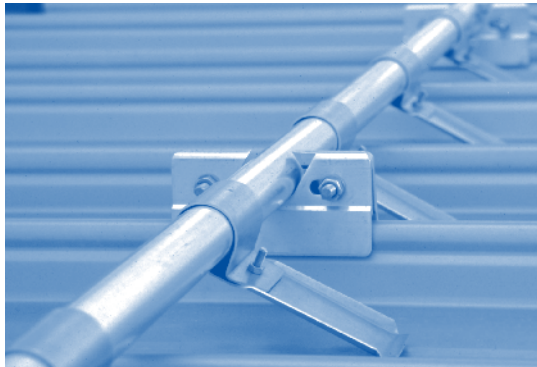
Apart from efficient use of diffused radiation, also with flat roof pitches and inconvenient orientating, this solution is known as "PV integrated into buildings" with partly higher support in individual countries.

RIB-ROOF Speed 500 profiled sheets are produced, in this case, without any profiling in the bottom boom and in flat design. The electric junction boxes are protected against slipping of snow and ice by means of our RIB-ROOF snow guard systems which are fastened on the bonded solar laminate. The cabling with strings can be laid on or in our snow guard pipes.

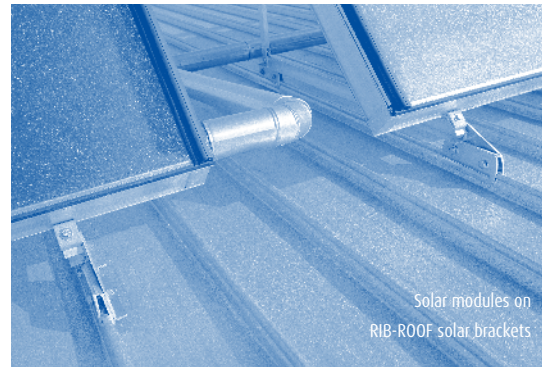
CONSTRUCTION DETAILS

SNOW – ICE – SOLAR – FALL ARREST SYSTEM

4.11 SNOW GUARD AND ICE STOPPING SYSTEM, SOLAR BRACKETS AND FALL ARREST SYSTEM



Snow guard systems are fastened with system-proof brackets, without penetration, of the profiled sheets on their ribs. They stop snow which lies on the roof and avoid possible snow slide.



Solar modules on
RIB-ROOF solar brackets

The solar brackets made out of aluminium (uncoated), are also applicable as brackets for lightning protection according to DIN EN 50164-1, test category N.

The resulting ice sheets which may occur when snow melts are prevented against slipping (photographs on previous page or images on next two pages) below the snow guard pipes (outside diameter 32 mm) by means of ice stoppers. Therefore, we recommend the use of aluminium (for TECU-profiled sheets are available copper snow guard brackets and ice stoppers) since unpleasant rust formation can arise on the edges of the pipes with corrosion-protected materials.

The screws (at least M8 x 40 mm) should be out of non-rusting material. The given tightening torque for screws is 20 Nm.

The amount and distance of snow guard rows (refer to following table) depend on the roof pitch and local snow load.

The generated shear, revoked by the snow on the roof, is eventually distributed to several snow guard rows. Double snow guard pipes aren't used any more.

Distances of snow guard rows

Snow load S_f	5°	10°	15°	20°	25°	30°	35°
0.75 kN/m ²	22.12	11.06	7.42	5.60	4.55	3.85	3.36
1.00 kN/m ²	16.59	8.33	5.60	4.20	3.43	2.87	2.52
1.25 kN/m ²	13.30	6.65	4.48	3.36	2.73	2.31	1.96
1.50 kN/m ²	11.06	5.53	3.71	2.80	2.24	1.89	1.68
1.75 kN/m ²	9.45	4.76	3.15	2.38	1.96	1.61	1.40
2.00 kN/m ²	8.26	4.13	2.80	2.10	1.68	1.40	1.26
2.25 kN/m ²	7.39	3.71	2.49	1.88	1.52	1.29	1.12
2.50 kN/m ²	6.65	3.34	2.24	1.69	1.37	1.16	1.01
2.75 kN/m ²	6.05	3.03	2.04	1.54	1.25	1.05	0.92
3.00 kN/m ²	5.54	2.78	1.87	1.41	1.14	0.97	0.84

Table with distances
of snow guard rows

Distances of snow guard rows in accordance with snow load on the roof S_f according to DIN 1055-5 and roof pitch in m.

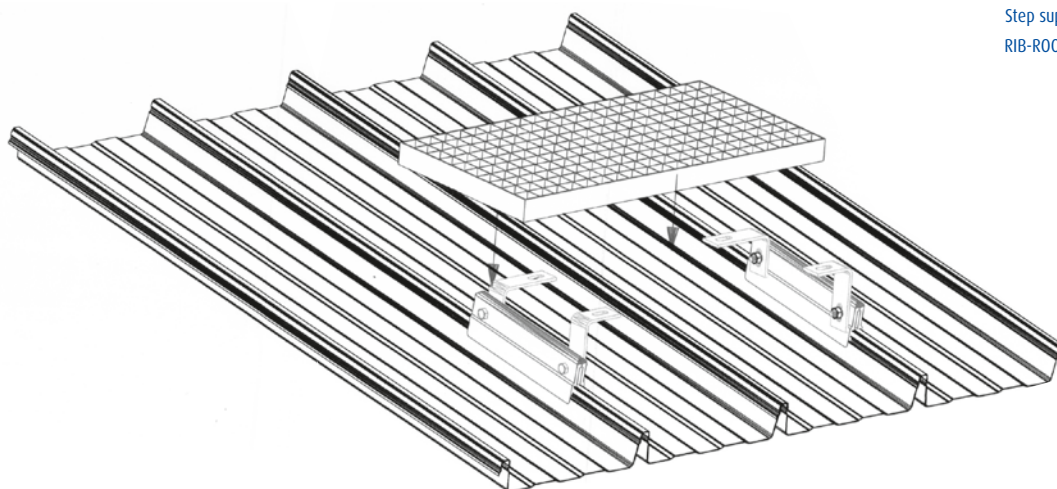
Maximum clip distance	RIB-ROOF 465	465 mm
	RIB-ROOF Speed 500	500 mm

The stated values are arithmetical **maximum values**.

We recommend a reduction of distances by 30 % in specific cases.

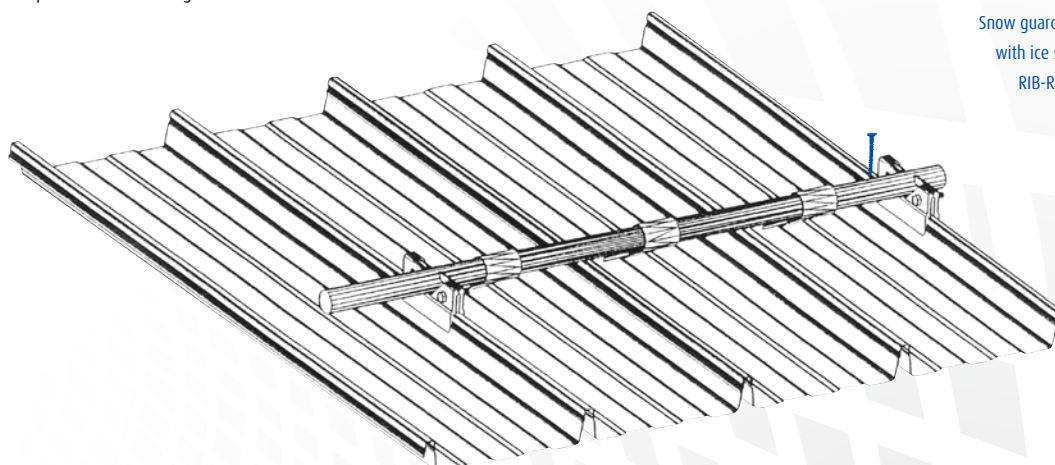
CONSTRUCTION DETAILS

SNOW – ICE – SOLAR – FALL ARREST SYSTEM



Step supports
RIB-ROOF 465

Snow guard systems are also used to relieve and keep the internal roof gutter clear of snow and ice.



Snow guard system
with ice stoppers
RIB-ROOF 465

Snow guard systems, tread supports and solar brackets mustn't be installed directly in the area of fixing elements, so that an length expansion of the profiled sheets is guaranteed.

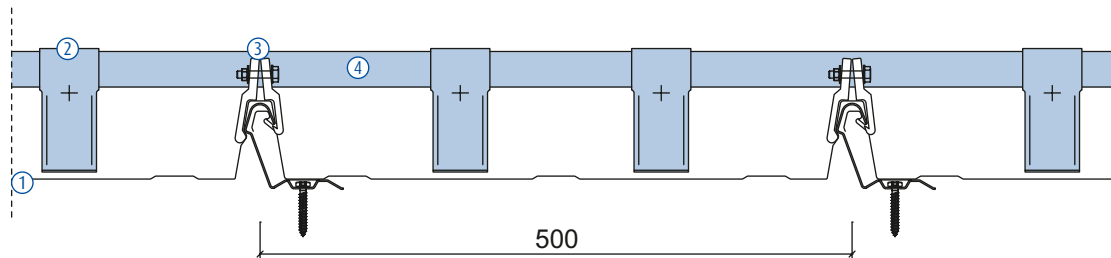
Tightening torque for screws 20 Nm.

Recommendation: Fasten the snow guard pipes at the verges against slipping by installing drilling screws in the snow guard pipe directly before the fixing elements.

CONSTRUCTION DETAILS

SNOW – ICE – SOLAR – FALL ARREST SYSTEM

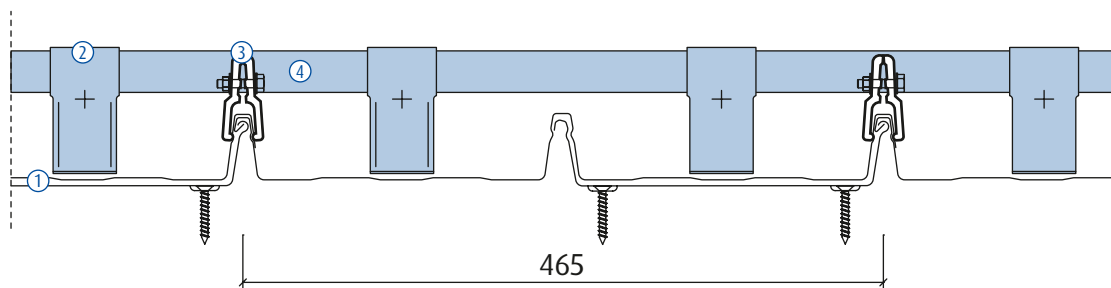
Snow guard system with ice stoppers RIB-ROOF Speed 500



- ① RIB-ROOF Speed 500
- ② Ice stopper
- ③ Snow guard bracket
- ④ Snow guard pipe Ø 32 mm

- Ice stopper 4.0 pc/m
- Snow guard bracket 2.0 pc/m

Snow guard system with ice stoppers RIB-ROOF 465



- ① RIB-ROOF 465
- ② Ice stopper
- ③ Snow guard bracket
- ④ Snow guard pipe Ø 32 mm

- Ice stopper 4.35 pc/m
- Snow guard bracket 2.15 pc/m

Installation of snow guard system/solar brackets RIB-ROOF 465 should always be carried out on the overlapping seam.



Tread supports



Single anchor point

Fall arrest system including

- penetration-free fixing
- intermediate crossing support
- corner bypass

CONSTRUCTION DETAILS

FLASHINGS

4.12 FLASHINGS



You will find detailed drawings, especially for flashings, with standard measurements in our order form at:

www.bestellblatt-kantteile.zambelli.de



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